

CURRENT ISSUES RELATED TO THE ASSESSMENT OF SEXUAL DEVIANCE IN
SPECIAL SEX OFENDER POPULATIONS

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ABSTRACT

The assessment of sexual deviance among sex offenders represents a mature and robust field of study, and yet there are particular offender populations that have received relatively little empirical attention and that were the focus of the current project. The present studies were archival in nature and utilized offender data from the Regional Treatment Centre (RTC) in Kingston, Ontario. Participants were adult male federal sex offenders who had been referred to the RTC for intensive sex offender treatment. As a requisite component of the program, participants completed a standardized assessment battery which included interviews, phallometric testing, and the administration of various psychometric instruments. Study 1 examined potential differences in phallometric responding based on participant ethnicity and phallometric stimulus type (i.e., visual or auditory). It was found that both White and visible minority offenders demonstrated greater deviant responding to auditory stimuli relative to visual stimuli, with no other significant differences in responding based on stimulus type between the two groups of offenders. These results suggested that both White and visible minority offenders were likely able to imagine their ideal victim when being exposed to auditory stimuli, which may have been influenced by a variety of victim characteristics including, but not limited to, victim ethnicity. Study 2 examined potential correlations between social desirability, IQ, and phallometric responding. The majority of the study hypotheses were not supported, although there was some evidence for the influence of social desirability on phallometric responding. Overall, the results of the study demonstrated the effectiveness of using differential and/or ratio transformations of penile plethysmography (PPG) data in order to accommodate the influence of extraneous variables on phallometric responding. Finally, Study 3 examined the influence of age on phallometric responding and the utility of an alternative measure of sexual deviance, the Multiphasic Sex Inventory (MSI). Age was generally found to be negatively correlated with phallometric responding, and as with Study 2, the results illustrated the importance of using PPG data transformations in order to control for the effects of variables such as age. The study also offered promising findings for the utility of the MSI as a measure of sexual deviance. Strengths, limitations, and implications are discussed.

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Chapter 1. Sexual Deviance: Theory and Measurement

1.1 Introduction

In the opening paragraphs of his late nineteenth century book, *Psychopathia Sexualis*, Richard von Krafft-Ebing (1886/1997) asserted that,

Sexuality is the most powerful factor in individual and social existence; the strongest incentive to the exertion of strength and acquisition of property, to the foundation of a home, and to the awakening of altruistic feelings... (p. 1).

While current scholars may challenge Krafft-Ebing's superordinate positioning of sexuality on the ladder of human motivation, his contention nonetheless serves to underscore the powerful influence that sexual arousal can often exert on behaviour.

Psychopathia Sexualis, Krafft-Ebing's seminal work, represented one of the first systematic attempts to conceptualize various forms of sexual variation, including homosexuality, pedophilia, nymphomania, necrophilia, incest, sadism, and masochism (indeed, Krafft-Ebing coined the latter two terms). By its 12th edition, the book included descriptions of 238 case studies. Although *Psychopathia Sexualis* was strictly intended for a professional audience (i.e., doctors and judges), Krafft-Ebing soon discovered that his work had gained a significant lay readership (Bullough, 1994). With each subsequent edition, Krafft-Ebing used increasingly technical language in an attempt to make his book inaccessible to general audiences. Despite his efforts however, Krafft-Ebing's work remained popular outside of the medical and legal fields for several years (Bullough, 1994). Indeed, one critic remarked that the enduring success of Krafft-Ebing's book, as evidenced by its continued republications, reflected a "pornographic interest on the part of the public" (Stuttgart, 1892, as cited in Krafft-Ebing 1886/1997, pp. vii).

Whether representing a pornographic interest or not, the popularity of Krafft-Ebing's (1886/1997) work clearly reflected society's long-standing fascination with individuals who commit sexually deviant acts. Many of the sexual preferences and behaviours described by Krafft-Ebing are not considered criminal by current standards, although some, such as necrophilia and pedophilia, have almost universally been met with strict sanctions across cultures and time periods. While individuals who commit crimes of a sexual nature are often met with fear and anger, it is clear that there is also an equally powerful desire to understand their underlying motivations. Although our knowledge of sex offenders has deepened substantially in

the intervening years subsequent to the first publication of Krafft-Ebing's work, our desire and need to further understand such individuals has certainly not waned.

1.2 Overview

The current document is separated into five chapters. Chapter 1 presents a general overview of relevant literature pertaining to sexual deviance, and addresses the following topics: 1) the prevalence and social impact of sexual offending; 2) a clarification of key concepts; 3) theories of sexual deviance, and; 4) issues surrounding the measurement of sexual preferences and arousal (with a particular focus on phallometric assessment). Chapters 2 to 4 outline the individual studies that comprised the current research project (pertaining to visible minority, cognitively impaired, and old sex offenders, respectively). Each of the three chapters provides a focused literature review followed by a description of the research objectives and hypotheses, methodology, and results of the particular studies. An initial discussion of the results of each study is presented within the individual chapters, with an overall discussion of the research findings, including implications of the results and potential avenues for further research, being presented in Chapter 5.

1.3 Prevalence of Sexual Offending

Sexual offending remains a pervasive problem in Canadian society, with over 20,000 incidents, comprising approximately 6% of total violent crimes, reported annually (Statistics Canada, 2015). While rates of sexual assault have slightly decreased by approximately 3% in recent years, sexual violations against children have increased by 6% since 2013 (Statistics Canada, 2015). Furthermore, the number of sexual offenders in federal institutions has increased relative to other offender types, accounting for over 13% of new admissions annually (Correctional Service of Canada (CSC), 2006). A similar trend has been noted in the United States, where sex offender incarceration rates have also steadily surpassed the overall increase in the prison population (La Fond, 2005).

Although appearing to constitute only a small proportion of violent crimes, it is pertinent to note that a staggering number of sexual offences (i.e., approximately 90%) are not reported to the police (Statistics Canada, 2008; Perreault & Brennan, 2010). Accordingly, it is estimated that approximately 25% of women and 20% of children under age 18 are victims of sexual assault (Statistics Canada, 2008).

1.4 Social Impact of Sexual Offending

Children who are sexually assaulted are at an increased risk for a variety of psychosocial issues, including depression, anxiety, behavioural problems, and school difficulties (Mullen, King, & Tonge, 2000). As adults, these individuals often report problems with relationships, sexuality, intimacy, and self-esteem (Mullen et al., 2000), and they are characterized by lifetime rates of depression, anxiety, personality disorders, and psychosis that are four times greater than that of the general population (Cutajar et al., 2010). Similarly, adult victims of rape are at an increased risk for posttraumatic stress disorder (PTSD), depression, suicide, substance abuse, and physical health issues (Kilpatrick & Acierno, 2003; Koss, Bailey, Yuan, Herrera, & Lichter, 2003). Alarming, suicide rates among rape victims have been reported to be as high as 33% (compared to 8% in the general population; Kilpatrick, Edmunds, & Seymour, 1992). Finally, a history of sexual assault places individuals at an increased risk for future victimization, particularly if the initial assault occurred during childhood or adolescence (Arata, 2002; Livingston, Testa, & VanZile-Tamsen, 2007; Messman & Long, 1996). For example, women who are raped before the age of 18 are twice as likely to be subsequently victimized as an adult compared to women who were sexually assaulted after age 18 (Tjaden & Thoennes, 2000). Such statistics paint a sobering picture indeed.

Given that the experience of sexual assault can often entail severe and long-standing psychological, emotional, and physical repercussions for victims, sexual offending has been described as both a criminal and a public health issue (Abel, Lawry, Kalstrom, Osborn, & Gillespie, 1994; Abel & Osborn, 1992). Taken together, the above findings highlight the necessity for ongoing research with sex offender populations, with the ultimate goal of significantly reducing rates of sexual offending in our society.

1.5 Conceptual Clarifications

The current project concerned, at its foundation, the assessment of sexual deviance. However, before wading into the fascinating (and often murky) waters that comprise this research field, it is prudent to first clarify key terms that are used throughout the remainder of the document, and that informed the hypotheses of the current project.

1.5.1 Sexual deviance

Researchers have noted that the extent to which sexual desires and/or behaviours are deemed to be deviant or pathological is rarely static (Laws & O'Donohue, 2008). However,

sexual deviance (at least as it pertains to the current project) may be broadly interpreted as encompassing the essential features of the paraphilias as outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; American Psychiatric Association, 2013). According to DSM-5, a paraphilia “denotes any intense and persistent sexual interest other than sexual interest in genital stimulation or preparatory fondling with phenotypically normal, physically mature, consenting human partners” (American Psychiatric Association, 2013, p. 685). In turn, a paraphilic disorder reflects “a paraphilia that is currently causing distress or impairment to the individual or a paraphilia whose satisfaction has entailed personal harm, or risk of harm, to others” (American Psychiatric Association, 2013, p. 685). Following from these descriptions, sexual deviance could thus be defined as “sexual interest in sexual practices equated with a paraphilia” (Akerman & Beech, 2012, p. 12). The definition of deviance provided by Akerman and Beech (2012) appropriately encompasses both sexual interest as well as behaviour, and it is essential for the purposes of the current project to further differentiate between these two fundamental facets of human sexuality.

1.5.2 Deviance in the context of sexual desire and response

Researchers have noted that the terms sexual desire and sexual response are frequently conflated, despite representing conceptually distinct processes (Rempel & Serafini, 1995). According to Rempel and Serafini (1995), sexual desire refers to a psychological process involving anticipation, motivation, and imagery, whereas a sexual response simply entails physiological arousal. Taken together, sexual desire and sexual response comprise the erotic response (Flak, Beech, & Fisher, 2008).

Singer (1984) provided a detailed conceptualization of the sexual response, arguing that it does not represent a unitary construct, but is rather further comprised of three sequentially occurring processes. The first process of Singer’s (1984) triarchic model of sexual response, referred to as the aesthetic response, is described as a “hedonic feeling in response to a sexual stimulus” (e.g., an attractive face or a pleasing voice; Singer, 1984, p. 233). Singer (1984) noted that aesthetic responses can be measured by monitoring gaze or facial expressions, or by asking participants to provide aesthetic ratings.

The second stage in Singer’s (1984) model, the approach response, occurs as the aesthetic response develops into a more active orientation toward the sexual stimulus. The approach response includes physical movement toward the stimulus, as well as the desire for bodily

contact. The final stage, termed the genital response, refers to the autonomic-somatic reactions involved in the sexual response, such as elevated heart and respiration rates, pupillary dilation, muscle tension, and (in males) penile tumescence. While Singer (1984) stated that any of the aforementioned physiological indicators would be amenable to study, he noted that the most reliable and convenient measure would be that of genital change (e.g., penile tumescence).

It can be seen that some conceptual overlap exists between Rempel and Serafini's (1995) definition of sexual desire and the first two stages described in Singer's (1984) triarchic model of sexual arousal. Specifically, Rempel and Serafini (1995) contrasted sexual desire and sexual response as reflecting a clear demarcation between psychological and physiological processes, respectively. Singer (1984), however, worked from a broader conceptualization, noting that sexual arousal has been variously defined as "a drive, appetite, incentive, motivation, perception, emotion, sensation, behaviour, or physiological response" (Singer, 1984, p. 230). This broader view was reflected in Singer's (1984) trichotomy of sexual arousal, as both the aesthetic and approach responses contain psychological elements to arousal (e.g., the inclusion of hedonic feelings and a desire for physical contact, respectively). While the two conceptualizations may not be entirely complementary, both Rempel and Serafini's (1995) framework as well as Singer's (1984) model still represent useful heuristics, as they provide adequate conceptual clarity so as to avoid issues of conflation when discussing sexual deviance.

Applying Rempel and Serafini's (1995) framework to the assessment of sexual deviance, sexual desire would be comprised of the individual's deviant sexual interests, desires, and preferences (independent of physiological arousal), whereas the sexual response would consist of the corresponding physiological reactions of arousal (such as those outlined previously). Considering Singer's (1984) model of sexual arousal, distinct methodological approaches would be utilized depending on the stage of sexual arousal that is being examined. While Singer (1984) proposed distinct assessment methods corresponding to each arousal response, studies of deviant sexual arousal have primarily focused on physiological responding, with current researchers having echoed Singer's sentiment that measures of genital change are likely the most reliable method of assessment in this domain (e.g., Kalmus & Beech, 2005).

1.5.3 Phallometry

The predominant physiological measure of sexual arousal has historically been phallometric assessment, particularly as it relates to the field of forensic psychology. While a

more detailed description of the history, methodology, psychometric properties, and controversies surrounding phallometric assessment is provided in subsequent sections, a note regarding terminology is warranted here. Briefly, phallometry involves the physiological measurement of penile tumescence in response to sexual and non-sexual stimuli. Phallometric assessment is also commonly referred to as penile plethysmography, or PPG, and the three terms are used interchangeably throughout the remainder of this document.

1.5.4 Sexual offenders

The current project examined issues related to the assessment of sexual deviance among male sex offenders. Within the context of measuring deviant arousal, Marshall and Fernandez (2000) broadly defined sexual offenders as “mature males who either coerce an adult female to have sex with them, or have sex with a child” (Marshall & Fernandez, 2000, p. 809). This definition is necessarily broad, and yet it does not capture the full heterogeneity of sex offenders, who can include rapists, child molesters, exhibitionists, necrophiliacs, voyeurs (and various other non-contact sex offenders), and those who commit acts of bestiality, for example. Such a definition further disregards juvenile and female sex offenders, and also fails to account for adult male-on-male acts of sexual violence. Furthermore, this definition does not consider the physical severity of the offending behaviour (e.g., genital fondling versus vaginal or anal penetration). However, the research literature pertaining to the assessment of sexual deviance has focused almost exclusively on males who have committed sexual acts against children and/or those who have engaged in forcible sexual activities with non-consenting adults, and this is reflected in the definition provided by Marshall and Fernandez (2000). The current project did not stray from the existing empirical paradigm in this regard, as it also focused exclusively on adult male offenders who have engaged in sexual acts against children (hereafter referred to as child molesters), those who have committed sexual acts against non-consenting adults (hereafter referred to as rapists), and those who have committed offences against both children and adults (hereafter referred to as mixed offenders). Within this overall group of sex offenders, the current project examined issues pertaining to ethnicity, cognitive functioning, and age.

1.6 Theories of Sexual Deviance

Further discussion of sex offenders and sexual deviance must first be embedded within a theoretical context. Stinson, Sales, and Becker (2008) identified several reasons that highlight the need for an etiological understanding of sex offender characteristics and motivations. First, in

order to prevent sexual offences from occurring, it is essential to understand what causes such behaviour. Second, an understanding of etiology is also required in order to identify appropriate treatment targets and protective factors that may aid in reducing sexual recidivism. Finally, and perhaps as an extension of the preceding points, etiological considerations of sexual deviance should be used to inform public policy and legislation regarding sex offenders, rather than relying on emotionally charged (and oft-misinformed) public perceptions.

Before outlining the predominant theories of sexual deviance, it must be reiterated that sex offenders can vary substantially in the nature and severity of their criminal behaviour. Still, within those offender types that represent the focus of the current research project (i.e., rapists and child molesters), many similarities have been noted. For example, rapists are typically prone to experience feelings of anger, fear, and depression, and to experience low self-esteem and thoughts of worthlessness (Langevin, et al., 1984; Robertiello & Terry, 2007). Rapists also tend to hyper-identify with the masculine role, hold negative views of women, strongly endorse rape myths, and be accepting of violence (Marshall, Laws, & Barbaree, 1990; Scully, 1990). Similarly, child molesters tend to be characterized by a constellation of common features, such as feelings of loneliness, inadequacy, worthlessness, vulnerability, and low self-esteem, while also tending to exhibit poor social skills and discomfort with adult relationships (Terry, 2006). Overall then, theories of sexual deviance are simultaneously tasked with accounting for both the common and unique etiological factors that predispose individuals to (and serve to maintain) sexually deviant thoughts and behaviours.

Theories of sexual deviance can be broadly divided into two categories: 1) single-factor theories, which focus on a single factor (or a circumscribed set of similar factors) as leading to the development of sexually deviant thoughts and/or behaviours, and, 2) multifactorial (or integrative) theories, that generally posit several separate but interrelated factors involved in the etiology and maintenance of sexual deviance. A brief outline and description of the most influential theories and typologies of sexual deviance is provided here.

1.6.1 Single-factor theories of sexual deviance

The following sections will highlight the most pertinent findings as they apply to single-factor theories of sexual deviance, differentiated according to primarily biological, evolutionary, behavioural, or cognitive processes.

1.6.1.1 Biological theories

Recent technological advances in neuroimaging and brain scanning techniques, measurement of bodily chemicals, and gene sequencing have led some researchers to posit primarily biological causes of sexually deviant thoughts and behaviours. Such biological mechanisms include: frontal and temporal brain lobe abnormalities (Aigner et al., 2000; Corley, Corley, Walker, & Walker, 1994; Cummings, 1999; Galski, Thornton, & Shumsky, 1990; Lang, 1993); low or abnormal cerebral blood flow (Raine & Buchsbaum, 1996); cerebral white matter deficiencies (Cantor et al, 2008); abnormalities in the production, distribution, or interaction of several hormones, including testosterone, cortisol, luteinizing hormone, follicle stimulating hormone, androstenedione, dehydroepiandrosterone sulfate, prolactin, and estradiol (Hucker & Bain, 1990; Lang, Flor-Henry, & Frenzel, 1990; Marieb, 2001); abnormalities in the levels or activity of several neurotransmitters, including serotonin, norepinephrine, and dopamine (Coccaro & Kavoussi, 1996; Kafka, 1997; Stoff & Vitiello, 1996); and intellectual disability (Day, 1994; O'Callaghan, 1998).

1.6.1.2 Evolutionary theories

Evolutionary theories have posited that current human behaviour is the result of thousands of years of adaptive changes aimed at improving genetic survival given specific environmental demands. Specifically related to sexual deviance, theorists have argued that our current environment is much different from that of our early ancestors, and thus some behaviours that were previously adaptive may now be deemed abnormal or dysfunctional (Kennair, 2003). For example, it has been hypothesized that rape, while currently considered a maladaptive form of sexual behaviour, may have been an adaptive sexual strategy among early humans, as it would have guaranteed that a male's genetic material would be passed on. Therefore, a propensity for rape would be genetically propagated within the species (Thornhill & Palmer, 2000). Some theorists have elaborated on this idea, and have stated that competitively disadvantaged males (i.e., those individuals who possess, or lack, certain characteristics that make them less desirable as reproductive partners) would have been inclined to use sexually coercive tactics in order to pass on their genetic material, which would have also had the indirect effect of passing on such coercive strategies (Figueredo, Sales, Russell, Becker, & Kaplan, 2000; Malamuth & Heilmann, 1998).

1.6.1.3 Behavioural theories

Behavioural theories of sexual deviance have relied on the principles of classical and operant conditioning in order to explain the behaviour of sex offenders. For example, classical conditioning theories hypothesized that a nonsexual stimulus simply became paired with sexual arousal, thus leading to the nonsexual stimulus eventually eliciting arousal itself. Theories that rest on operant conditioning principles asserted that the physiological response of sexual arousal to nonsexual stimuli is reinforced by environmental rewards, leading to increased arousal by such stimuli (Lockhart, Saunders, & Cleveland, 1988). Reinforcers of deviant sexual arousal may include sexual satisfaction, control, humiliation, or subjugation of victims, or removal of a negative mood state (e.g., depression or anxiety; Groth & Hobson, 1997; Marshall & Fernandez, 1998; Ward & Hudson, 1998).

1.6.1.4 Cognitive theories

Theorists have proposed underlying cognitive processes for a variety of psychological disorders, such as depression and anxiety, and this has been extended to theories of sexual deviance (Marshall, Laws, & Barbaree, 1990). For example, some researchers have noted that sex offenders often report poor parental attachment and greater perceived parental rejection, thus suggesting that anxious-ambivalent and avoidant attachment styles may predispose certain individuals to sexual offending (Beech & Mitchell, 2005; Marshall, 1993; Marshall & Mazzucco, 1995). Specifically, individuals with an anxious-avoidant attachment style are often particularly uncomfortable with themselves and with intimacy with adult partners. In order to mitigate their anxiety, such individuals may turn to relationships with children or engage in self-serving sexual behaviours with others whom they see as deserving of sexual abuse (Marshall, 1993). Alternatively, individuals with an avoidant attachment style often have poor empathy skills and can become hostile towards others, and combined with sexual and aggressive urges, they may develop feelings of entitlement and a desire for power that can lead to sexual offending, particularly given their unwillingness to establish intimate relationships (Marshall, 1993).

Researchers have also identified several cognitive schemas that are generally characteristic of sex offenders. For example, sex offenders often have a strong self-serving bias, allowing them to justify their deviant sexual behaviours as being paramount to the needs of their victims (Hanson, Gizzarelli, & Scott, 1994). Sex offenders also tend to view their victims as deserving of their victimization, or believe that their victim ultimately desired the sexual contact

(Hanson, 1999). Finally, it has been demonstrated that sex offenders often have marked deficiencies in perspective-taking and in recognizing others' emotions, leading to selfish or egocentric sexual behaviours (Geer, Estupinan, & Manguno-Mire, 2000; Hanson & Scott, 1995).

1.6.2 Integrative theories of sexual deviance

While the single-factor theories outlined above have provided important insights into the etiology and maintenance of sexual deviance, it is generally accepted that the nature of human thought and behaviour is quite complex. As such, any theory that sets out to adequately conceptualize sexually deviant thoughts and behaviours will also necessarily be complex (Stinson et al., 2008). Accordingly, several researchers have attempted to incorporate the components of various single-factor theories in an effort to create more comprehensive, integrated models of sexual deviance; these theories are briefly highlighted here.

1.6.2.1 Finkelhor's precondition model

Finkelhor's (1984) precondition model focused on perpetrators of child sexual abuse, and he postulated four preconditions considered necessary for a sex offence to occur. The first precondition is the motivation to sexually abuse, which is comprised of three separate components: 1) emotional congruence; 2) sexual arousal; and 3) blockage. Emotional congruence refers to the emotional role that the victim plays for the offender, as well as the impact of the sexual act itself. Specifically, some individuals may satisfy their emotional needs by relating sexually to a child, while others may be motivated more strongly by sexual release, with a child simply filling the role of sexual partner. The second component of motivation, sexual arousal, suggests that an individual may simply be motivated to engage in a sexually inappropriate act with a child if he finds the child to be sexually arousing. Finally, blockage refers to the motivation to sexually offend against a child when other sources of sexual gratification (e.g., age-appropriate partners) are either unavailable or do not result in satisfactory sexual gratification.

Finkelhor (1984) referred to the second precondition as overcoming internal inhibitors (e.g., learned social norms, moral values). Disinhibiting factors, such as intoxication, poor impulse control, or ineffective legal sanctions, increase the likelihood that an individual will act on his motivation to sexually offend against a child. The third precondition involves overcoming external inhibitors, or those factors that make it more difficult for an individual to victimize a child (e.g., good parental supervision, strong social networks, strong maternal bond between

mother and child, etc.). The final precondition requires overcoming the resistance of the child, highlighting the fact that child molesters typically target emotionally deprived children or those who are unfamiliar with sexual boundaries or sexual abuse. Overall, Finkelhor (1984) stated that all four preconditions are necessary for a sexual offence to occur, noting that an individual will progress through each stage in a sequential fashion until ultimately committing an offence.

1.6.2.2 Marshall and Barbaree's integrative theory

The underlying assumption of Marshall and Barbaree's (1990) integrative theory held that human males are biologically wired to engage in both sexual and aggressive behaviours in order to achieve self-interested goals. As a result, males must develop inhibitory controls that allow them to reduce their reliance on sexual and aggressive tactics if they are to successfully adapt to the current social and legal environment. However, the authors noted that some individuals experience negative events in childhood (e.g., poor attachment with caregivers, poor socialization, etc.) that make them more inclined to engage in aggressive behaviours, including sexually aggressive behaviours. Marshall and Barbaree (1990) also pointed to cultural factors, particularly values and beliefs related to interpersonal violence, male dominance, and negative attitudes toward women, which can predispose certain males to engage in sexually deviant behaviours. Finally, the authors stated that transitory situational factors (e.g., use of alcohol or drugs, anger toward females, etc.) can influence an individual's decision to engage in deviant sexual behaviours.

1.6.2.3 Hall and Hirschman's quadripartite model

Hall and Hirschman's (1991) quadripartite model outlined four factors that the authors purported are most significant in the development of sexually deviant thoughts and behaviours. The first component is physiological sexual arousal, which may not necessarily involve deviant stimuli (and thus is not a sufficient condition for sexual offending to occur). The second component, termed cognitive appraisal, refers to the constellation of mental processes that are related to the understanding of emotions and behaviour, as well as the prediction of consequences. Specifically, Hall and Hirschman (1991) pointed to cognitive myths and justifications that may allow an individual to believe that his deviant behaviours are acceptable, as well as one's beliefs regarding the likelihood of being punished for such behaviour. The third factor described by the authors is affective dyscontrol, which refers to negative affective states (particularly anger) that become so powerful as to be perceived as uncontrollable, thus

preventing the individual from inhibiting sexually inappropriate behaviours. The final factor in Hall and Hirschman's (1991) theory is comprised of personality problems, such as selfishness, exploitative style, and lack of remorse, that serve to intensify the impact of the other three factors, thereby further increasing the likelihood that the individual will engage in sexually abusive behaviour.

1.6.2.4 Malamuth's confluence model

Malamuth's (1998) confluence model outlined three primary factors that interact and converge in order to produce sexually deviant behaviour. The first factor, termed promiscuous or impersonal sexual style, refers to an irresponsible and immature approach to sexual activity. Individuals characterized by this sexual style lack a desire for sexual intimacy or the formation of stable sexual relationships. The second factor in the model, termed hostile masculinity, represents a hostile and defensive orientation toward others, coupled with a hypersensitivity to perceived rejection. The final factor described by Malamuth (1998) is a high-dominance, low-nurturance approach to interpersonal relationships, which is characterized by a general lack of compassion or empathy, as well as a preoccupation with self-interested goals and motives. Overall, Malamuth (1998) stated that these three factors interact with one another and ultimately converge into sexually inappropriate behaviour.

1.6.2.5 Ward and Siegert's pathways model

Like Finkelhor's (1984) precondition model, Ward and Siegert's (2002) pathways model also focused exclusively on individuals who sexually offend against children. The authors identified four symptom clusters that characterize child molesters: 1) intimacy and social skills deficits; 2) distorted sexual scripts; 3) emotional dysregulation; and 4) cognitive distortions. Regarding the first symptom cluster, it was hypothesized that childhood experiences of abuse and neglect distorts an individual's perception of functional relationships, predisposing him to a variety of interpersonal problems (e.g., low self-esteem, poor emotional regulation, difficulty forming intimate relationships). The second symptom cluster refers to distortions of one's sexual scripts that occur as a result of experiences that disrupt a child's normal learning process, such as being a victim of sexual abuse. The resulting distortions may take the form of identification of inappropriate sexual partners, the interpretation of nonsexual cues as being sexual, or inappropriate behaviours related to sexual arousal (e.g., sadistic behaviour).

Ward and Siegert (2002) noted that proper emotional regulation is necessary for managing affective states, setting goals, and engaging in goal-directed behaviour. As such, the authors stated that a lack of appropriate experiences or modelling of emotional skills by others during one's childhood may lead to the development of the third symptom cluster, emotional dysregulation. Individuals who are unable to successfully manage their emotional states may set dysfunctional goals (e.g., seeking sexual gratification regardless of partner willingness), or may act in a sexually deviant manner if it has successfully reduced negative affect in the past. The final symptom cluster, cognitive distortions, refers to maladaptive attitudes or beliefs that are supportive of deviant sexual behaviour, and that are used to interpret the behaviour of others, make inferences about their emotional or mental state, and predict their future behaviour. For example, child molesters may endorse beliefs that their sexual urges and behaviours are uncontrollable, or that sexual activity will not cause harm to a child.

Following from their four symptom clusters, Ward and Siegert (2002) outlined five different pathways that lead to deviant sexual behaviour, noting that while an offender will be characterized by each symptom cluster to some degree, one of these will serve as the primary causal mechanism that leads to a sexual offence. Pathway 1, termed intimacy deficits, refers to offenders who engage in opportunistic offences if their preferred sexual partners are unavailable. These individuals are characterized by intimacy deficits and an insecure attachment style, and turn to sexual relationships with children in order to ease feelings of loneliness and avoid rejection from adults. Pathway 2, deviant sexual scripts, describes individuals characterized by distorted cognitions related to the appropriateness or desirability of sexual contact (such as those previously outlined by various cognitive theories of deviance) that subsequently guide the offender's inappropriate sexual behaviour.

Individuals characterized by Pathway 3, emotional dysregulation, have difficulty identifying and regulating their emotional states, resulting in opportunistic offences in which sexual activity is used as a coping mechanism. Pathway 4, antisocial cognitions, refers to individuals who tend to possess normal sexual scripts and who do not demonstrate deviant sexual arousal. Rather, these offenders hold attitudes and beliefs that are generally supportive of a criminal lifestyle, while also being impulsive, aggressive, and lacking empathy. As a result, such individuals may sexually assault a child given a combination of intense sexual desire and the unavailability of appropriate sexual partners. Finally, Pathway 5, multiple dysfunctional

mechanisms, describes individuals who exhibit all four symptom clusters to a significant degree (i.e., distorted sexual scripts, distorted cognitions regarding children and sex, intimacy and interpersonal skills deficits, and emotional dysregulation). Individuals characterized by this pathway typically engage in opportunistic deviant sexual behaviour when there is also a lack of conflicting goals or sufficient inhibitory mechanisms.

1.6.2.6 Stinson, Sales, and Becker's multimodal self-regulation theory

The primary assumption of Stinson and colleagues' (2008) multimodal self-regulation theory held that pronounced deficits in self-regulation, which emerge in response to early childhood experiences, largely shape the development of sexual deviance. The authors argued that biological temperaments characterized by emotional vulnerability, proneness to negative emotion, and difficulty with self-soothing, interact with early negative socialization experiences (e.g., parental substance abuse and psychopathology, peer victimization, physical, emotional, and sexual abuse, etc.) to create deficits in self-regulatory skills. Individuals who lack such skills often engage in maladaptive strategies that involve immediate gratification and little personal effort, including sexual activity.

The authors noted that at some point during sexual development, arousal becomes linked with a deviant stimulus through the mind's attempt to cognitively label the experience of sexual arousal and identify a source for that arousal. Because sexual arousal and gratification involving deviant stimuli are immediate reinforcers that require little effort and are often not met with negative consequences, these practices become reinforced as the favoured response to internal dysregulation. Finally, the authors noted that a variety of cognitive and personality variables, such as egocentricity, sensation-seeking, sense of entitlement, and impulsivity, serve to lower inhibitions or provide justifications for engaging in sexually inappropriate behaviours, thus increasing the probability of such behaviour occurring.

1.6.3 Sex offender typologies

Although not strictly considered to be theories of sexual deviance, sex offender typologies are similar in that they represent an effort to classify offenders based on salient characteristics and primary motivations for offending. Furthermore, such typologies are often congruent with the various theories of sexual deviance. As such, the most prominent sex offender typologies are briefly outlined here.

1.6.3.1 Rapist typologies

Beginning with Groth (1979), rapists have typically been classified based on their primary motivation for committing a sexual offence, with a broad distinction between sexually and non-sexually motivated offenders (Barbaree et al., 1994). Groth's (1979) original work, which was later expanded upon and refined by Berger (2000), identified four rapist subtypes. The first group of offenders, referred to as power reassurance (or compensatory) rapists, are characterized by a lack of proper social skills, doubts regarding their desirability, and feelings of inadequacy. Rape, then, may help to reduce feelings of inadequacy for such individuals. While their coercive sexual behaviour may involve verbal and/or physical intimidation, in general these individuals use only the minimum level of force necessary in order to accomplish the rape, as they do not desire to injure their victims (Budrionis & Jongsma, 2003).

The second group of offenders outlined in Groth's (1979) typology, termed power assertive rapists, use rape in order to mitigate doubts about their own masculinity. Power assertive rapists tend to be impulsive and opportunistic, using aggressive behaviour to inflict emotional trauma on their victims. Individuals who comprise Groth's (1979) third offender type, anger retaliation rapists, are motivated by power and anger, using severe physical and sexual force in order to punish their victims. As Groth (1983) noted, such sexual acts represent the "sexual expression of aggression, rather than the aggressive expression of sexuality" (p. 165). The fourth type of offender described by Groth (1979) are referred to as anger excitation (or sadistic) rapists. As the name implies, sadistic rapists become sexually aroused by causing fear and pain in their victims, and typically lack remorse for their behaviour.

Building on the work of Groth (1979), The Massachusetts Treatment Center: Rapist Typology, version 3 (MTC:R3) put forward by Knight and Prentky (1990) also described four primary types of rapists. The first type consisted of opportunistic rapists, who are motivated by immediate sexual gratification, and who thus commit impulsive and unplanned acts of sexual aggression. Pervasively angry rapists, who comprised the second type of offender, are characterized by globalized and undifferentiated anger that tends to influence many of their daily behaviours. Such individuals are impulsive, and are prone to violence even in the absence of victim resistance. The third group of offenders, sexual rapists, are characterized by enduring sexual preoccupations, which can also be coupled with aggressive tendencies. Thus, for such individuals, acts of rape may be the result of a "synergistic relation between sex and aggression"

(Knight, 1999, p. 312), or they may be motivated by feelings of inadequacy. Finally, vindictive rapists are motivated by power and a hatred of women, and they typically degrade their victims through the use of bodily harm.

The four rapist types were further subdivided based on several dimensions, including a history of antisocial behaviour, social competence, expressed aggression, offence planning, global anger, sadism, sexual preoccupation, and hostility towards women (Knight, 1999). Thus, a total of nine rapist subtypes have been extracted from Knight and Prentky's (1990) original framework: 1) opportunistic, high social competence; 2) opportunistic, low social competence; 3) pervasively angry; 4) sexual, overtly sadistic; 5) sexual, muted sadistic; 6) sexual, non-sadistic, high social competence; 7) sexual, non-sadistic, low social competence; 8) vindictive, low social competence; and 9) vindictive, moderate social competence (see Knight, 1999, for a detailed review).

1.6.3.2 Child molester typologies

Just as with rapist typologies, researchers have generally classified child molesters based on their primary motivation for offending. Groth, Hobson, and Gary (1982) put forward a fixated-regressed dichotomy of child molesters. Fixated offenders are characterized by an engrained and intense attraction to children that typically develops during adolescence; such offenders generally do not develop an interest in adult partners as they age, nor do they tend to engage in age-appropriate sexual relationships (Finkelhor, 1984). In contrast, the deviant behaviour of regressed offenders represents a departure from their typical attraction to adults, and is instead motivated by external stressors (e.g., unemployment, substance abuse, loneliness, etc.) that result in reduced self-confidence and self-esteem (Schwartz, 1995; Simon, Sales, Kaskniak, & Kahn, 1992).

Again building on the work of Groth and colleagues (1982), Knight and Prentky (1990) developed the Massachusetts Treatment Center: Child Molester Typology, version 3 (MTC:CM3), which utilized two dichotomous axes on which to classify offenders. Axis I categorized offenders based on their level of fixation (i.e., the strength of pedophilic interest) and their level of social competence (i.e., success in age-appropriate activities such as employment and adult relationships). Axis II evaluated offenders based on their amount of contact with children and the meaning of said contact (i.e., interpersonal or sexual). Axis II also addressed the degree of physical injury (if present) that is inflicted on victims as well as the presence or

absence of sadism. Offenders are assigned a separate designation on each axis; in total, offenders can be assigned to one of four subtypes on Axis I, and to one of six subtypes on Axis II (see Knight & Prentky, 1990, for a detailed review).

1.7 The Assessment of Deviant Sexual Arousal

Theories and typologies of sexual deviance have provided researchers with an essential context within which to embed their examination of variables that may predict sexual offending. It is important to note that both theories of sexual deviance, as well as empirical research, have highlighted the fact that not all sex offenders are necessarily characterized by deviant interests. Rather, offenders may engage in deviant sexual behaviour for a variety of reasons, including lack of empathy (Geer et al., 2000; Keenan & Ward, 2000); cognitive distortions that justify coercive sexual behaviour (Hanson, 1999; Hanson et al., 1994); regulation of negative affect (Ward & Hudson, 1990; Ward and Seigert, 2002); globalized anger and aggressive behaviour (Knight & Prentky, 1990; Marshall & Barbaree, 1990); inability to effectively manage external stressors (Schwartz, 1995; Simon et al., 1992); or to control, humiliate, or subjugate victims (Knight, 1999; Marshall & Fernandez, 1998).

While deviant sexual behaviour may result from myriad factors, most theoretical accounts have highlighted the influential role that deviant interests tend to play in the commission of sex offences, and this is supported in the research literature. Indeed, sexual deviance is consistently demonstrated to be one of the strongest predictors of sexual recidivism (e.g., Hanson & Bussiere, 1998; Hanson & Morton-Bourgon, 2005; Rice, Harris, & Quinsey, 1990). Thus, accurate assessment of deviant sexual arousal represents a necessary first step in the classification, risk prediction, and treatment of sex offenders. The significance of such research is reflected by a substantial increase in studies examining sexual offending since the 1980s, including research on the measurement of sexual deviance (Langevin et al., 2004; Roberts, Doren, & Thornton, 2002).

1.8 Phallometric Assessment

Although several measures of male sexual arousal have been developed in recent years, the predominant measure of deviant sexual arousal within offender populations has historically been penile plethysmography. Phallometric assessment was initially developed by Kurt Freund in the 1950s. The original purpose of Freund's work was to create an objective measure of male sexual arousal that could accurately distinguish between heterosexual and homosexual military

recruits for the Czechoslovakian army (Freund, 1957, as cited in O'Donohue & Letourneau, 1992). Freund's work was later adapted by Canadian researcher Vernon Quinsey to assess deviant sexual arousal among male sex offenders (Marshall, 1996). In this latter capacity, PPG has been used both as an initial assessment of deviant sexual arousal, as well as an ongoing measure of treatment success, as indicated by reduced deviant responding following treatment completion (Lalumiere & Harris, 1998; Seto, 2001). Indeed, the use of phallometric assessment within the forensic arena dates back several decades (Hanson & Morton-Bourgon, 2005).

1.8.1 Apparatus

Beginning with Freund, two predominant methods of phallometric assessment have been developed. The original plethysmograph developed by Freund (1957, as cited in O'Donohue & Letourneau, 1992) used an airtight glass cylinder that was placed on the individual's penis and which measured volumetric changes that resulted from penile tumescence. Specifically, displacement of air within the cylinder caused by tumescence allowed for the measurement of volumetric change in the penis. However, the cumbersome nature of the volumetric apparatus prompted the development of alternative assessment methods. In particular, circumferential procedures that measured changes in the diameter of the penis quickly became popular.

The two primary forms of circumferential assessment, using either a mercury strain gauge (Bancroft, Jones, & Pullan, 1966) or an electromechanical strain gauge (Barlow, Becker, Leitenberg, & Agras, 1970), involve the use of a ring-like device that is placed around the shaft of the penis. An electrical current is passed through the gauge, which then measures changes in resistance to the current that is caused by penile tumescence. While volumetric measurement is generally considered to be more sensitive to changes in penile size (McConaghy, 1999; Murphy & Barbaree, 1994), Kuban, Barbaree, and Blanchard (1999) found high levels of agreement (i.e., $r = .90$) between volumetric and circumferential assessments (although the concordance rate dropped considerably when penile responding was less than 10%). Due to their availability and relative ease of use, circumferential devices remain the most common apparatus employed in forensic phallometric assessments today (Kalmus & Beech, 2005).

For both volumetric and circumferential assessment procedures, deviant sexual arousal is indicated by a significant increase in penis size in response to deviant sexual stimuli (e.g., stimuli involving pre- or post-pubescent children, or that depicting coercive and/or aggressive sexual acts). Participants' responses to deviant stimuli are often examined relative to their responding to

appropriate sexual stimuli (i.e., age-appropriate, non-coercive sexual depictions), as it is common for both offenders and non-offender controls to demonstrate some arousal to deviant phallometric stimuli (Lalumiere & Harris, 1998; Seto, 2001).

1.8.2 Stimulus modalities

Phallometric stimuli may be presented in several forms, including visual slides, audio vignettes, videos, written text, and fantasy (Kalmus & Beech, 2005; Seto, 2001). While live action videos have been shown to produce the highest level of physiological arousal among sex offenders (e.g., Abel, Blanchard, & Barlow, 1981; Abel, Blanchard, Becker, & Djenderedjian, 1978), deviant stimuli presented in this manner may actually reduce classification accuracy due to high levels of responding across both offender and non-offender samples (Marshall, 2006; Proulx, 1989). Due to this ceiling effect, visual and auditory stimuli are predominantly used for the purpose of forensic PPG assessments, while video stimuli are rarely used (Proulx, 1989).

Visual stimuli typically consist of a set of slides depicting a range of sexual stimuli (e.g., male versus female, prepubescent versus post-pubescent, clothed versus nude, varying degrees of coercion, etc.). Auditory stimuli are comprised of various vignettes that describe a range of sexual activities, narrated in the first, second, or third person. Similar to visual stimuli, auditory stimuli generally vary in the activity being portrayed, the sex and age of the model, and the degree of coercion and/or explicitness involved (Kalmus & Beech, 2005).

Few studies have compared the effectiveness of visual slides and audiotapes in eliciting deviant physiological arousal, or their respective abilities to discriminate offender groups from one another or from non-offenders. However, those studies that have been conducted report comparable findings (Abel et al., 1981; Looman & Marshall, 2001). Several researchers have advocated for the use of a combination of visual and auditory stimuli in order to enhance discriminative accuracy, as visual stimuli can be used to determine age and gender preferences, while auditory stimuli can be used to discern sexual activity preferences (Chaplin, Rice, & Harris, 1995; Golde, Strassberg, & Turner, 2000; Laws, Hanson, Osborn, & Greenbaum, 2000; Proulx, 1989).

Interestingly, auditory stimuli appear to be more effective for assessing deviance among particular offender populations. Specifically, incest offenders have been shown to demonstrate more deviant responding to auditory stimuli, while often responding normally to visual slides (Lang, Black, Frenzel, & Checkley, 1988). More recently, Fernandez and Marshall (2004, as

cited in Marshall, 2006) found that very few incest offenders responded to visual stimuli, while nearly 70% were significantly aroused by auditory stimuli. Thus, it has been hypothesized that auditory stimuli are sufficiently vague as to allow incest offenders to imagine their ideal victims to whom they are sexually attracted, whereas visual stimuli depicting unfamiliar children may preclude arousal (Marshall, 2006).

Regardless of stimulus modality, it has been noted that there is a large degree of variability between various stimulus sets. For example, visual materials (either slides or video) vary in background choice, level of colour and brightness, and the number of persons being depicted, while audio materials can differ in the voice and dialect used, the type of sexual behaviour being depicted, and the degree of explicit description (Lykins et al., 2010; Merdian & Jones, 2011).

1.8.3 Statistical analysis

Much like the variation in assessment instruments and protocols, there is also a range of methods used to score and interpret phallometric test results. Specifically, participants' responses may be reported as raw scores, percent of full erection (PFE), z-score transformations, or as a ratio of responding to deviant and neutral stimuli (Barbaree, 1990). While raw scores of penile circumference change represent the simplest reporting method, such data are generally only amenable to within-subject comparison, as the significance of a change in penis size would be relative to each individual given anatomical idiosyncrasies.

Data may also be presented as a percentage of full erection (PFE) score. While this method allows for between-subject comparison, scores are only accurate if the range of penile circumference (from flaccid to fully erect) is known. Of course, accurate information in this regard would be difficult to obtain, leaving most researchers who report PFE scores to use an estimate of maximum full erection. However, no agreed upon standard exists for such an estimate, with researchers using cut-off values ranging from 6.7 to 47 millimetres (Howes, 2003; Kuban et al., 1999; Proulx et al., 1997).

One of the most popular methods of reporting results has involved the transformation of data into z-scores, thereby presenting each participant's responding as deviations from his mean response with a mean of zero and a standard deviation of one. An early study found that z-score transformations captured a significantly higher proportion of variance than PFE and raw scores (52.7%, 32.5%, and 30.1%, respectively; Earls, Quinsey, & Castonguay, 1987). Subsequent

studies have also found that z-score transformations have better discriminative power than either PFE (Byrne, 2001, as cited in Merdian & Jones, 2011; Harris, Rice, Quinsey, Chaplin, & Earls, 1992) or raw scores (Byrne, 2001, as cited in Merdian & Jones, 2011). For these reasons, Lykins and colleagues (2010) noted that z-scores continue to be one of the preferred methods for presenting phallometric data in the literature. Still, some authors have pointed out that z-score transformations can distort the phallometric profiles of low responders to a considerable degree, thereby increasing Type I error rates (Murphy & Barbaree, 1994).

Finally, deviance indices may be used in order to present data as a ratio of deviant to appropriate responding, derived either from peak response values or from the average of participants' responding to stimulus categories (Launay, 1999). Deviance indices have been shown to better discriminate between offender types relative to scores derived from individual stimulus categories (Harris et al., 1992; Quinsey & Chaplin, 1984). Furthermore, deviance indices remain consistent following habituation, and also allow practitioners to make meaningful comparisons between participants (Merdian & Jones, 2011).

1.8.4 Participant variables

Several participant characteristics may influence the results of a phallometric assessment. For example, diurnal fluctuations in hormone levels (Rowland, Greenleaf, Dorfman, & Davidson, 1993), feelings of anxiety (Hale & Strassberg, 1990), as well as various medical conditions (e.g., head injury, impotence; Merdian & Jones, 2011), can all impact penile responding to phallometric stimuli. Researchers have also demonstrated that alcohol and drug consumption can impact participants' physiological responding to phallometric stimuli (George et al., 2008; Wilson, Lawson, & Abrams, 1978; Wormith, Bradford, Pawlak, Borzecki, & Zohar, 1988). Other factors that may impact participants' responding include age, ethnicity, and cognitive functioning; as these represented the variables of primary concern pertaining to the current research project, they are reviewed in detail in subsequent chapters.

1.8.5 Low responding, habituation, and faking

Phallometric assessments are frequently susceptible to low responding (i.e., participants who do not exhibit a minimum level of penile tumescence that is deemed necessary for valid interpretation of test data; Kalmus & Beech, 2005). Low responders can complicate subsequent data interpretation, and may impact the validity of research findings. For example, Kuban, Barbaree, and Blanchard (1999) found that volumetric measures of penile tumescence were

consistently related with circumferential measurements only once participants had achieved a minimum tumescence of 2.5 mm.

Low responding to phallometric stimuli can often be the result of participant habituation to phallometric stimuli. An early study by Quinsey (1983) found that individuals became increasingly proficient at inhibiting penile responding with repeated testing, as they gained more familiarity with the phallometric procedures and stimuli. Indeed, Kolla, Klassen, Kuban, Blak, and Blanchard (2010) reported that participants exhibited 50% less arousal on their second exposure to phallometric stimuli.

Along with habituation, offenders may also be motivated to fake their responses during PPG assessments. Offenders typically attempt to reduce their arousal to deviant stimuli in order to avoid social stigma or perceptions of increased recidivism risk (Stinson & Becker, 2008). Accordingly, extensive research has demonstrated that offenders are able to effectively suppress their arousal to phallometric stimuli (Freund, Watson, & Rienzo, 1988; Mahoney & Strassberg, 1991; Murphy & Barbaree, 1994), and upon questioning often report not attending to the stimuli, or using mental imagery methods in order to suppress arousal (Flak, Beech, and Fisher, 2006). In fact, it has been demonstrated that up to 80% of participants are able to suppress penile responding during phallometric assessment (Farkas, Sine, & Evans, 1979; Golde, Strassberg, & Turner, 2000; Hall, Proctor, & Nelson, 1988; Howes, 1998; Mahoney & Strassberg, 1991).

Most researchers attempt to mitigate issues of low and fake responding by simply excluding low responders from subsequent data analyses. However, it has been noted that there is no widely accepted cut-off score at which to classify low responding (although less than 20% of full erection appears to be most common; Howes, 2003). While removing low responders may aid in improving the overall reliability of phallometric test data, it can also introduce several new issues. Most strikingly, typical exclusion criteria often results in a large percentage of participants being removed from analysis (i.e., 20% to 70%; Looman, Abracen, Maillet, & DiFazio, 1998). That such a large proportion of participants is routinely excluded from analysis calls into question the overall validity and utility of phallometric assessment, both in research and practical applications. Furthermore, excluding low responders can serve to inflate the significance of group differences, thereby distorting the final results (Murphy & Barbaree, 1994). Interestingly, Harris, Rice, Quinsey, Chaplin, and Earls (1992) argued that excluding low

responders may be unnecessary, as doing so had no impact on discriminative or predictive validity in their sample.

1.8.6 Reliability and validity

Issues of low responding and faking, as well as a lack of standardized assessment procedures, have made it difficult to clearly ascertain the reliability and validity of phallometric assessment. The following sections review key findings in the PPG literature as they pertain to internal consistency, test-retest reliability, construct validity (including discriminative and concurrent validity), convergent validity, and predictive validity.

1.8.6.1 Internal consistency

The internal consistency of PPG assessments can be determined by examining the correlations among participants' responses to individual stimulus items within particular categories (e.g., age, gender, degree of coercive behaviour). Researchers have generally reported a high degree of internal consistency, with alpha coefficients ranging from .66 to .97 (Abel, Huffman, Warberg, & Holland, 1998; Marshall & Fernandez, 2003).

1.8.6.2 Test-retest reliability

Measurements of test-retest reliability for PPG are made difficult by issues such as participant habituation, as previously discussed. Perhaps accordingly, few studies have examined the reliability of penile plethysmography (Marshall & Fernandez, 2000; Simon & Schouten, 1991). Hall, Shondrick, and Hirschman (1993) conducted a meta-analysis of nine studies that compared penile responding to sexually aggressive stimuli in sexually aggressive participants versus control groups. The authors reported test-retest reliability coefficients ranging from $r = .26$ to $r = .85$, with lower reliability coefficients coming from those studies that used retest intervals greater than one day. Using a combined sample of pedophiles, rapists, and non-sex offenders, Wormith (1986) reported a reliability coefficient of $r = .53$, while Barbaree, Baxter, and Marshall (1989) reported a value of $r = .29$ in a non-offender sample.

1.8.6.3 Construct validity

Phallometric assessment rests on the sexual preference hypothesis originally put forward by Freund & Blanchard (1981). The sexual preference hypothesis holds that "men who engage in sexually deviant acts are thought to prefer deviant behaviour and their associated stimuli (over) those behaviour and stimuli which are normalized or socially acceptable" (Murphy & Barbaree, 1986, p. 13, as cited in O'Donohue & Letourneau, 1992). The sexual preference hypothesis

consists of both a strong and a weak form. The strong form of the hypothesis holds that sex offenders have an absolute preference for deviant sexual behaviour over non-deviant behaviour, while the weak form suggests that offenders are more aroused to deviant sexual objects/practices in comparison to non-offenders (Clegg & Fremouw, 2009). Applying the hypothesis to phallometry then, significant genital arousal to deviant stimuli is interpreted as a preference for deviant sexual behaviour.

Placing PPG within the context of Rempel and Serafini's (1995) and Singer's (1984) work, phallometric assessment measures a physiological response (i.e., a genital response), the results of which are used to infer a participant's sexual desire(s). Both Singer (1984) and Rempel and Serafini (1995) conceptualized a mutually reinforcing cycle between psychological/emotional and physiological processes, with both sets of authors acknowledging that internal thoughts and feelings are likely to precede physical arousal in the majority of instances. This conceptualization is in line with current cognitive-behavioural models of functioning, which have generally posited that cognitions mediate corresponding emotional and behavioural responses (e.g., Dobson & Dobson, 2009).

While it is intuitively appealing to assume that penile tumescence is a direct consequence of sexual preference, O'Donohue and Letourneau (1992) pointed out that phallometric assessment is a highly inductive process. Specifically, the authors noted that the basic premise of PPG (i.e., that genital arousal to phallometric stimuli is a reflection of sexual preference) relies on several levels of inference (see Figure 1.1), which may serve to undermine the validity of the assessment data. Gaither (2000, as cited in Merdian & Jones, 2011) also pointed out that penile plethysmography only measures one aspect of sexual arousal (i.e., penile tumescence), while sexual preference is a more holistic concept, echoing the conceptualizations put forth by Singer (1984) and Rempel and Serafini (1995). Similarly, J. Looman (personal communication, August 30, 2013) cautioned against conflating sexual preference with sexual arousal, noting that offenders may not demonstrate penile arousal to phallometric stimuli despite preferences for deviant sexual activity (or vice versa).

In a recent meta-analysis of 132 studies ($n = 1,918$), Chivers, Seto, Lalumiere, Laan, and Grimbos (2010) reported the correlation between phallometric test data and self-reported sexual arousal among males as $r = .66$, indicating that there is at least a relationship between objectively measured and self-reported sexual arousal. A unique study conducted by Rea, Debriere, Butler,

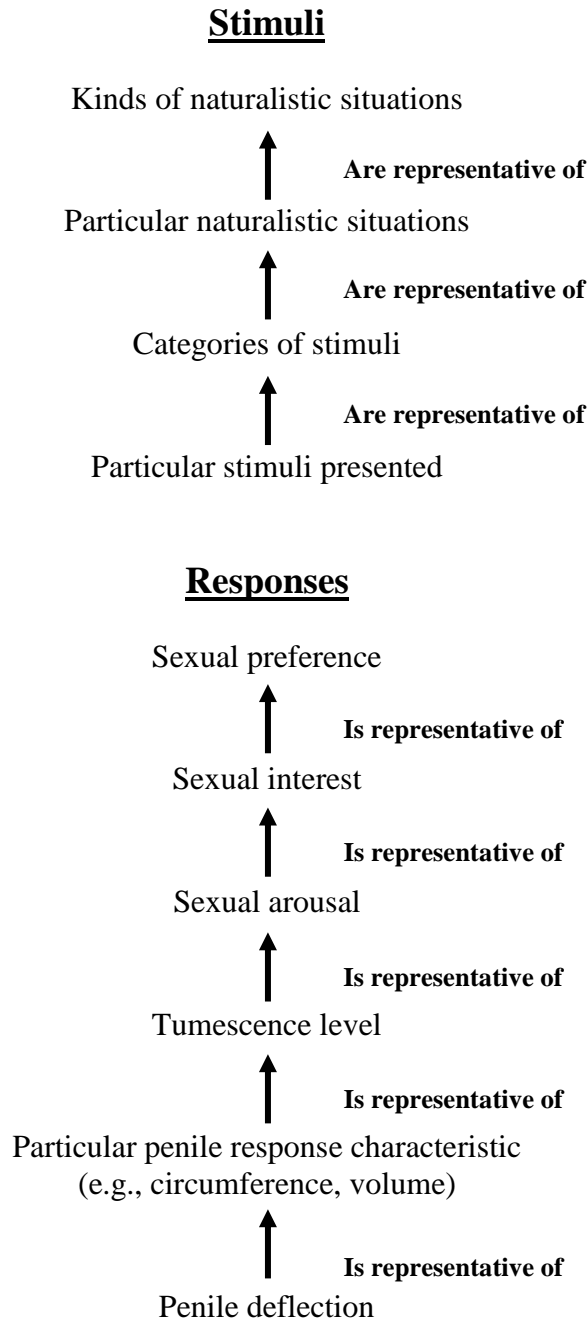


Figure 1.1 Constructs and levels of inference in penile tumescence assessment. Adapted from “The psychometric properties of the penile tumescence assessment of child molesters,” by W. O’Donohue and E. Letourneau, 1992, *Journal of Psychopathology and Behavioural Assessment*, 14, 123-174. Copyright 1992 by Springer. Adapted with permission.

and Saunders (1998) exposed four child molesters to naturalistic situations (e.g., children playing in a park) while measuring their arousal via portable PPG devices. The authors found that participant arousal patterns were consistent with both laboratory arousal profiles as well as characteristics of participants' previous offences. Thus, while acknowledging the issues raised by O'Donohue and Letourneau (1992), these studies provide some preliminary evidence for the construct validity of phallometric assessment.

1.8.6.4 Convergent validity

Correlations with self-reported arousal and with other measures of sexual deviance may be used to demonstrate the convergent validity of phallometric assessment. As noted previously, Chivers and colleagues (2010) reported a correlation of .66 between PPG-derived arousal profiles and participant self-report. As discussed in section 1.9, there are several alternative measures designed to assess sexually deviant preferences, although many of these have not been directly compared to phallometric assessment. Even so, Laws, Hanson, Osborn, and Greenbaum (2000) found that a card sort task (which requires participants to rank order a set of stimulus cards based on attractiveness) was correlated with PPG in assessing gender preferences among child molesters. Phallometric assessments have also been shown to correlate with scores on the Screening Scale for Pedophilic Interests (SSPI; Seto & Lalumiere, 2001), while Canales, Olver, and Wong (2009) found a significant correlation between sexual deviance items on the Violence Risk Scale – Sexual Offender version (VRS-SO; Wong, Olver, Nicholaichuk, & Gordon, 2003) and the phallometric profiles of child molesters.

1.8.6.5 Discriminative validity

Researchers examining the discriminative validity of PPG among offender samples have reported sensitivity levels (i.e., the likelihood of correctly detecting deviant preferences) ranging from .29 to .89, while specificity levels (i.e., the likelihood of not detecting deviant preferences when they are not present) have ranged from .79 to .97 across studies (Blanchard, Klassen, Dickey, Kuban, & Blak, 2001; Blanchard et al, 2006; Freund & Watson, 1991; Seto, Lalumiere, & Blanchard, 2000). Accordingly, Lalumiere and Harris (1998) noted that phallometric assessment has consistently been shown to possess better specificity than sensitivity.

Phallometric assessment has generally been found to reliably distinguish extra-familial child molesters from both non-offender controls as well as other types of sex offenders (Abel et al., 1998; Barbaree & Marshall, 1989; Card & Dibble, 1995; Quinsey & Chaplin, 1988; Quinsey,

Chaplin, & Carrigan, 1979; Wormith, 1986). Still, Barbaree and Marshall (1989) noted that there is often considerable overlap between arousal patterns among different groups. For example, only 35% of extra-familial child molesters in their sample obtained profiles indicating an exclusive child-only preference. Similarly, Firestone, Bradford, Greenberg, and Nunes (2000) found that half of their sample of child molesters displayed equal or greater arousal to adult stimuli in comparison to child stimuli.

Two meta-analyses examining deviant sexual interests among rapists found that this offender population demonstrated stronger interest in non-consensual sexual stimuli compared to either community or non-sex offender controls (Hall, Shondrick, & Hirschman, 1993; Quinsey, Rice, & Harris, 1995). Several subsequent studies have found similar results (Howes, 1998; Lalumiere, Quinsey, Harris, Rice, & Trautrimas, 2003; Miner, West, & Day, 1995; Seto & Kuban, 1996), although some researchers have reported non-significant findings (Eccles, Marshall, & Barbaree 1994; Looman & Marshall, 2005). Overall, rapists generally appear to demonstrate stronger arousal to non-consensual phallometric stimuli, at least when compared to non-sex offenders (Clegg & Fremouw, 2009; Lalumiere & Rice, 2007). Still, Kalmus and Beech (2005) warned that high discriminative error rates are often reported in the literature, casting doubt on the ability of phallometric assessment to reliably distinguish rapists from non-offenders.

1.8.6.6 Concurrent validity

In an effort to establish the concurrent validity of PPG, researchers have often employed postdiction analyses in an attempt to predict an offender's criminal history based on his phallometric profile (Simon & Schouten, 1991). Several studies have demonstrated significant correlations between historical offence characteristics and offender arousal patterns (Abel, Barlow, Blanchard, & Guild, 1977; Abel et al., 1978; Avery-Clark & Laws, 1984; Barbaree & Marshall, 1989; Card & Dibble, 1995; Firestone, Bradford, Greenberg, Larose, & Curry, 1998; Malcolm, Andrews, & Quinsey, 1993), although some researchers have reported non-significant relationships in this regard (Looman & Marshall, 2005; Malamuth & Check, 1983). Overall however, there appears to be a strong relationship between particular offence variables (i.e., degree of violence, number of prior victims) and offenders' phallometric profiles. As Merdian and Jones (2011) stated,

[it] seems unreasonable to dispute a link between sexual arousal to deviant stimuli and inappropriate sexual behaviour...[D]espite the theoretical uncertainties regarding phallometric assessment, sexual arousal is a large part of the genesis of sexual offending, and the PPG is a useful measure of this arousal (p. 143).

1.8.6.7 Predictive validity

The predictive validity of penile plethysmography (at least as it pertains to forensic evaluations) may be established by examining the correlation between assessment profiles and subsequent offender recidivism. Extensive research has consistently demonstrated that sexual deviance (as measured by PPG) is one of the strongest predictors of sexual recidivism. In a meta-analysis of 61 studies examining sex offender recidivism, Hanson and Bussiere (1998) found that sexual interest in children, as measured using phallometry, was the single best predictor of sexual recidivism ($r = .32$). A follow-up meta-analysis of 115 studies produced between 1943 and 2003 ($n = 29, 450$) also found that PPG-assessed interest in children was the strongest predictor of sexual recidivism ($d = .31$; Hanson & Morton-Bourgon, 2005), while any deviant interest was also found to be a significant predictor ($d = .24$). Finally, Rice, Harris, and Quinsey (1990) found that arousal to violent stimuli was predictive of recidivism among rapists ($r = .33$). As Seto (2001) has asserted, “[r]eviewers of the scientific literature conclude that phallometrically-measured sexual interests are the most consistently identified distinguishing characteristics of sex offenders, in contrast to other variables that have been studied, such as empathy, social skills, and general psychopathology” (p. 67).

Ultimately, given the contradictory research findings to date, it would seem that very few firm conclusions can currently be drawn regarding the validity of penile plethysmography in the assessment of deviant sexual arousal. Several authors have pointed out that inconsistent findings reported in the literature are likely due in large part to the lack of standardization across studies (Barker & Howell, 1992; Howes, 1995; Marshall & Fernandez, 2000; Murphy & Barbaree, 1994; Seto, 2001). Including the testing variations already outlined (i.e., differences in apparatus, stimuli, and statistical analyses used, as well as inter-individual variations among participants), assessments can also differ in the number and nature of stimuli used, stimulus presentation order, and length of stimulus presentation time (Kalmus & Beech, 2005; Merdian & Jones, 2011). Thus, it is perhaps not surprising that research examining the reliability and validity of the procedure has produced somewhat equivocal findings.

1.8.7 Ethical considerations

Given the lack of standardized assessment and analysis procedures, issues of faking and low responding, and the variable levels of reliability and validity that are reported in the literature, some researchers have argued that phallometric testing may have limited usefulness for accurately assessing deviant sexual interests in offenders (e.g., Marshall & Fernandez, 2000). Furthermore, several legal and ethical issues have been raised regarding the use of phallometric assessment. First, the PPG procedure is inherently intrusive, as it requires individuals to place a device on their penis and submit to ongoing monitoring as they are exposed to pornographic stimuli (Laws, 2009). Second, using visual stimuli depicting children may be deemed unethical, as the children could not provide informed consent when the pictures or videos were created (Seto, 2001). Third, Seto (2001) noted that the presentation of stimuli depicting graphic scenes involving non-consensual sex or sex with children may be deemed unethical by some due to the possible deleterious effects that it could have on offenders. Finally, the legal implications of various government and private organizations being in possession of (and actively using) material that is deemed to be child pornography have also been raised (Flak, Beech, & Fisher, 2006; Looman & Marshall, 2001; Seto, 2001; Tudway & Darmoody, 2005).

However, Seto (2001) has presented a cogent defense of phallometry, noting that increasing use of audiotaped stimuli, as well as the emergence of digital rendering software (used to create realistic human figures), allows researchers and technicians to circumvent the issue of informed consent among stimuli subjects. Such technology may also partially ameliorate the concern of organizations being in possession of illegal pornographic material, as no real individuals are depicted. Regarding the third objection of potential deleterious effects on offenders, Seto (2001) pointed out that phallometric assessment is only clinically appropriate in situations where the individual is already known to have committed a sexual offence, and thus such individuals have likely had previous exposure to other accounts of deviant sexuality presented in various formats (e.g., reading materials, videos, group therapy, etc.).

Overall then, it can be argued that the results of a phallometric assessment may assist in reducing the risk of future sexual offences from occurring, and thus perhaps such a contentious procedure is ethically justified (Merdian & Jones, 2011). Indeed, Seto (2001) stated that PPG

“provides valuable information that cannot otherwise be obtained” (p. 70), further adding that plethysmography is not redundant even in the assessment of men who admit to deviant interests, as it is the relative strength of such interests that are informative in the prediction of sexual recidivism.

1.9 Alternative Measures of Sexual Deviance

As noted previously, several alternative measures of sexual deviance have been developed or adapted as potentially viable alternatives to phallometric assessment, including: polygraphy, groin temperature measurement, pupillometry, eye-tracking measures, galvanic skin response, electroencephalography, card sort tasks, self-report inventories, and various viewing time and information-processing paradigms (Akerman & Beech, 2012; Kalmus & Beech, 2005). While an exhaustive review of each alternative methodology is outside the scope of the current paper, a brief overview of the most notable measures is provided here.

1.9.1 Other physiological measures

Aside from phallometric assessment, numerous physiological measures of arousal have been developed. However, the majority of these measures have not received widespread support from researchers or clinicians for a variety of reasons, including: 1) they have garnered little empirical attention (e.g., electroencephalography and galvanic skin response measurement; Card & Farrall, 1990; Howard, Longmore, Mason, & Martin, 1994); 2) their utility has been questioned due to concerns of validity, particularly construct and convergent validity (e.g., polygraphy, pupillometry, startle blink response measurement, and abdominal temperature measurement; Beck, Barlow, & Sakheim, 1983; Cross, 2001; Garrett, Harrison, & Kelly, 1989; Hecker, King, & Scoular, 2006, as cited in Akerman & Beech, 2012); or, 3) they are highly susceptible to fake responding (e.g., eye tracking and viewing time paradigms; Fischer & Smith, 1999; Renaud et al., 2009).

1.9.2 Card sort tasks

Card sort tasks involve the presentation of sexual stimuli (similar to that used in PPG), which offenders are then required to rate based on how attractive or arousing they find each stimulus to be (Kalmus & Beech, 2005). Such tasks correspond to Singer’s (1984) first stage of arousal, the aesthetic response. Card sort procedures have been shown to possess a high degree of discriminative accuracy between groups of admitting sex offenders. Specifically, Holland, Zolondek, Abel, Jordan, and Becker (2000) demonstrated that a card sort task was able to

accurately identify deviant sexual interest in children among admitting pedophilic sex offenders, while Laws, Hanson, Osborn, and Greenbaum (2000) found that a similar card sort procedure was able to differentiate female and male preferences among admitting child sex offenders.

Unfortunately, studies examining the utility of card sort tasks among non-admitting sex offender samples have provided much less encouraging results. Haywood and Grossman (1994) found that, compared to admitting child sex offenders, those who denied their offending behaviour rated images of children as significantly less attractive (mean rating = 13.3 to 15.6 versus 0 to 3.8, respectively). Furthermore, Hunter, Becker, and Kaplan (1995) reported little correspondence between card sort ratings and phallometric scores among a sample of adolescent sex offenders, only finding significant correlations for 4 of the 14 categories assessed. Such results highlight the susceptibility of card sort tasks to denial or faking, limiting the utility of such face-valid procedures in the context of forensic assessment.

1.9.3 Modified Stroop task

The original Stroop task was designed to assess for particular forms of cognitive impairment. The task involves the presentation of colour words written in various colours, and requires participants to name the colour that each word is written in (not the word itself) as quickly as possible (Stroop, 1935, as cited in Akerman & Beech, 2012). So, for example, if the participant was presented with the word *red* written in the color blue, a response of “blue” would be correct, while a response of “red” would be incorrect. It has been demonstrated that interference occurs (i.e., it takes longer to name the colour) when the word is written in a different colour (e.g., the word red written in the colour blue). Thus, in contrast to reading (which is an overlearned response), colour naming is interpreted as a non-automatic response that requires a greater amount of cognitive processing and which thus serves to delay an individual’s response.

The emotional Stroop task is a modification of the original Stroop paradigm, and it has recently been explored as a potential measure of sexual deviance. In the context of deviance assessment, the emotional Stroop task presents participants with neutral and emotional/sexual words in various colours, requiring them to name the colour that the words are printed in. Examples of neutral words include items such as milk and newspaper, while sexual words include items such as woman, penetrate, dominance, schoolgirl, rape, and grope (Price, Beech, Mitchell, & Humphreys, 2013). A significant difference in colour naming reaction times between

neutral and sexual words is interpreted to be the result of interference caused by the emotional content of the words. Specifically, the strength of the cognitive and affective associations with particular sexual words corresponds with increased latency to responding, indicating that such items are more salient to the participant and thus are a reflection of sexual preferences (Smith, 2009).

Studies examining the efficacy of emotional Stroop tasks for assessing sexual deviance have demonstrated that sex offenders exhibit significantly longer response latencies to sexual words in comparison to control samples (Price et al., 2013; Price & Hanson, 2007; Smith & Waterman, 2004). However, none of these studies found significant differences in response latencies between sex offenders and other types of offenders, leaving the researchers to advocate for the development of specific stimulus sets that reflect the idiosyncratic nature of sex offenders' deviant interests (Price et al., 2013). Smith (2009) noted that the nature of the emotional Stroop task makes it very difficult to fake, and thus he advocated for the use of the measure as a complement to other procedures in the initial assessment and ongoing monitoring of sexual deviance.

1.9.4 Implicit Association Test (IAT)

The IAT is a reaction time task originally designed to measure implicit cognitions regarding socially sensitive issues (e.g., racism), and the measure has recently been adapted to assess sexual deviance. Just as with other cognitive processes, it is posited that the cognitive elements of sexual interest consist of both explicit cognitions (e.g., memories of sexual experiences, fantasies) and implicit cognitions that represent unconscious influences (e.g., internalized sexual scripts, sexual impulses; Spiering & Everaerd, 2007). While explicit cognitions can be accessed introspectively, implicit cognitions are not accessible via conscious thought. Following from this, the IAT compares reaction times to various concept pairings in order to assess the degree of automatic association between particular cognitions (i.e., the degree of implicit association). The strength of association between an object category (e.g., *adult*, *child*) and an attribute category (e.g., *sexy*, *not sexy*) is inferred from the speed with which the participant sorts the stimuli into categories (Babchishin, Nunes, & Hermann, 2013).

Using a computer and keyboard, participants sort stimuli into one of four categories by pressing one of two keyboard keys. Each key corresponds to one object category and one attribute category (e.g., *adult* and *sexy*; *adult* and *not sexy*). The speed of a participant's

responding is thought to reflect the strength of association between categories that share a keyboard key. Participant response times are presumably faster when categories that share a key are strongly associated with one another (e.g., *chocolate* and *good*) relative to categories that are not strongly associated which share a response key (e.g., *liver* and *good*; Babchishin et al., 2013).

In a recent meta-analysis of 12 studies (including published and unpublished literature) utilizing IAT measures to assess deviant sexual interest in children, Babchishin and colleagues (2013) found a significant overall moderate effect size ($d = .65$) for the ability of IATs to distinguish between child sex offenders and control samples (i.e., non-offenders, non-sex offenders, or rapists). Akerman and Beech (2012) noted a lack of research on IATs designed to assess interest in coercive sex; a literature review conducted by the current researcher did not reveal any recent publications to suggest otherwise.

The use of IATs to assess deviant sexual interest has several appealing benefits. Namely, such measures are inexpensive, non-invasive, and easy to administer. Furthermore, IATs have been shown to be difficult to fake (Ferguson & Zayas, 2009; Fiedler & Bluemke, 2005) and are resistant to socially desirable responding (Gawronski, LeBel, & Peters, 2007). While Gress and Laws (2009) noted some potential limitations of IAT paradigms (e.g., novelty, habituation), such measures have generally been received as a promising addition to the field of deviance assessment (e.g., Akerman & Beech, 2012).

1.9.5 Multiphasic Sex Inventory (MSI)

The MSI is a standardized 300-question self-report inventory designed to assess psychosexual characteristics among sexual offenders (Nichols & Molinder, 1984). The measure consists of six primary scale domains, including: 1) Validity scales (measuring socially desirable responding, denial, and minimization); 2) Accountability scales (measuring perceived victimization, offence justifications, and attitudes toward treatment); 3) Sexual Deviance scales (assessing cognitions and behaviours leading up to a sexual assault, as well as the “style, magnitude and duration of sexually deviant behaviour”; Craig et al., 2006, p. 91); 4) Paraphilia scales (assessing various facets of offending behaviour, including preferences for fetishism, voyeurism, obscene phone calls, bondage, and sado-masochism); 5) Sexual Dysfunction scales (examining sexual inadequacies, impotence, physical disability, and premature ejaculation), and; 6) the Sex Knowledge and Beliefs scale (measuring knowledge of sexual anatomy and physiology; Craig et al., 2006).

The MSI has been shown to possess adequate internal consistency across scales, with alpha coefficients ranging from .50 to .90 (Kalichman, Henderson, Shealy, & Dwyer, 1992). MSI scale scores are also consistent with theoretical descriptions and observed behaviour of sex offenders, highlighting the construct validity of the measure. Specifically, Kalichman and colleagues (1992) found an inverse relationship between victim age and scores on the Child Molest scale, a positive relationship between trait anger and the Rape scale, and a positive relationship between trait anxiety and the Exhibitionism scale. MSI scores have also been found to be consistent with physiological measures of arousal (Bernard, Fuller, Robbins, & Shaw, 1989), and to predict treatment outcome with 70% accuracy (Simkins, Ward, Bowman, & Rinck, 1989). The most recent version of the MSI, the MSI-II (Nichols & Molinder, 2000), has also been shown to correlate significantly with PPG-assessed deviant arousal (Stinson & Becker, 2008; Tong, 2007).

Recently, Craig and colleagues (2006) investigated the utility of the MSI as a predictor of sexual recidivism. The authors found good predictive accuracy for several MSI scales at two year follow-up, including the Sexual Obsessions scale (Area under the Curve (AUC) = .85), the Child Molest scale (AUC = .74), the Rape scale (AUC = .78), and the Paraphilia scale (AUC = .74). Furthermore, the overall Sexual Deviance factor, which was also a predictor of recidivism at two year follow-up (AUC = .78), made a significant contribution to recidivism prediction independent of an actuarial risk measure (i.e., the Static-99) at two year and five year follow-ups.

Given that the MSI is a self-report measure, concerns regarding socially desirable responding are warranted. Indeed, Kalichman and colleagues (1992) warned that the measure may be susceptible to response bias. However, the authors did find that the Justifications scale of the MSI (which examines the respondent's tendency to deny responsibility for deviant behaviour) was moderately correlated with validity scales on the Minnesota Multiphasic Personality Inventory (MMPI) and with scores on the Marlowe-Crown Social Desirability Scale (MCSDS). Haywood, Grossman, Kravitz, and Wasyliw (1994) reported similar results, finding that validity scores on the MSI and MMPI were significantly correlated. Kalmus and Beech (2005) stated that although the MSI may be vulnerable to faking, the measure's strength lies in its ability to detect attempts at biased responding. Taken together, these findings left Craig and colleagues (2006) to conclude that "[f]ew psychometric instruments have proved to be as reliable and accurate measures of psychosexual functioning as that of the MSI" (p. 233).

1.10 The Current State of Measures of Sexual Deviance

The previous sections have highlighted several promising alternatives and/or supplements to phallometric assessment in the measurement of sexual deviance. However, it has been demonstrated that the majority of such measures are either in their infancy, or are prone to many of the same problems as PPG (such as faking, for example). In a recent review, Marshall (2014) acknowledged that cognitively-based measures of sexual deviance may well replace phallometric assessment in the near(ish) future, but noted that evidence demonstrating the value of such measures is currently insufficient to warrant the abandonment of PPG. Furthermore, it is worth reiterating that studies have consistently found that sexual deviance, as measured by penile plethysmography, is one of the strongest predictors of sexual recidivism (Hanson & Bussiere, 1998; Hanson & Morton-Bourgon, 2005; Quinsey et al., 1995); such findings likely represent one of the primary reasons for the continued use of PPG (Merdian & Jones, 2011). Ultimately then, despite concerns regarding the efficacy of phallometric assessment, it is still widely considered to be the most convenient and reliable measure of sexual arousal currently available (Flak, Beech, & Fisher, 2006; Kalmus & Beech, 2005; Marshall & Fernandez, 2000; Merdian & Jones, 2011; Seto, 2001).

1.11 Summary

As this chapter has illustrated, the research literature regarding penile plethysmography represents a mature field of study, dating back to its origins in Kurt Freund's laboratory in 1960s Czechoslovakia. Since that time, phallometric assessment has become (in)famous within the forensic arena, as its tenure as a measure of deviant sexual arousal among sex offenders dates back several decades. And yet, despite the established use and extensive empirical evaluation of the procedure, particular issues remain almost curiously neglected in the literature. Specifically, several researchers (the current author included) have noted a dearth of knowledge regarding the potential influence of ethnicity, cognitive functioning, and age on phallometric responding. Although some of these issues have received more attention than others (e.g., the effects of aging), many issues remain to be explored.

While the overarching purpose of the project was to examine the efficacy of measuring sexual deviance in general (and the utility of penile plethysmography in particular), it was divided into three separate studies designed to address specific lacunae in the current empirical literature. As noted near the outset of the document, each of the following three chapters is

dedicated to a specific subset of offenders that represented the foci of the overall project (i.e., visible minority, cognitively impaired, and old offenders). Relevant literature is first reviewed, followed by a description of the research objectives and hypotheses, methodology, and results of each study. An initial discussion of the results of each study is presented within the individual chapters, with an overall discussion of the findings and potential avenues for further research being presented in the final chapter.

In sum, it is clear that phallometry has been met by nearly equal numbers of both supporters and detractors since its introduction to the forensic arena. While this difference may be viewed by some as detrimental, the current researcher, for one, welcomes such passionate and lively debate. The ongoing discourse regarding the utility of PPG as a measure of sexual deviance has stimulated a wealth of carefully planned and rigorously executed studies. And while the empirical findings currently remain somewhat equivocal regarding the validity of the procedure, the end consumers of the product (e.g., technicians, clinicians, lawyers, etc.), and ultimately society at large, can only benefit from such research. And so it was with an eager and optimistic attitude that the current research project was approached. There is still much to be learned about the assessment of sexual deviance that is well beyond the scope of this project. Still, it is hoped that the findings presented here serve to enhance our knowledge, if even by a small margin, of how best to measure sexual deviance among sex offenders.

Chapter 2. Study 1: Ethnicity and Phallometric Assessment

2.1 Literature Review

2.1.1 Introduction

The population of Canada is becoming increasingly multiethnic. Recent trends indicate that visible ethnic minorities comprise 19.1% of the population, with this number expected to double by 2031 (Statistics Canada, 2013). In this context, the disproportionate representation of visible minority groups within the Canadian criminal justice system is of serious concern. For example, recent statistics from the Office of the Correctional Investigator of Canada (OCI) have indicated that Aboriginal individuals comprise 24.6% of the current total inmate population, while only comprising 4.3% of the Canadian population (OCI, 2015). Similarly, Black individuals comprise 9.5% of federal offenders, while comprising less than 3% of the population (OCI, 2013). Correspondingly, over approximately the past 10 years, the populations of Aboriginal and Black offenders have increased by 46.4% and 80%, respectively (OCI, 2012; OCI, 2013). Similar trends have been noted in other Western nations, including the United States and Great Britain, where visible minority groups are also disproportionately represented among prison populations (Ashworth & Davies, 1997; Cowburn, Lavis, & Walker, 2008a; Cullen, 1995; Elkins & Olgundoye, 2001; Pallone & Hennessy, 1999; Sabol, Minton, & Harrison, 2007; Stephan, 2001; Wolf Harlow, 1998). Within Canada, visible minority offenders are overrepresented among inmates placed in maximum security institutions and administrative segregation (CSC, 2010; OCI, 2013), they are more likely to be involved in use of force incidents (OCI, 2013), and they tend to serve a greater proportion of their sentences within an institution before their initial release (OCI, 2009). Of particular relevance to the current project, research has indicated several important differences between White and visible minority sex offenders (as delineated in the following sections). Taken together, these findings highlight the pertinent need for further research with these populations.

2.1.2 Definitions of offender ethnic groups

The matter of how to appropriately identify and label research participants based on ethnic background is a thorny topic that lends itself to a host of scientific, political, and ethical issues (Anand, 1999; Aspinall, 2002; Bopal, 2006; Bradby, 2003; Cowburn et al., 2008a; Yuen, 1997). Indeed, some researchers have debated the utility of studying ethnic differences at all (Bradby, 2003; Nazroo, 2003). Accordingly, there is little consensus regarding the most

appropriate label for describing research participants based on ethnic background, particularly when one aims to make a dichotomous distinction between individuals identified as White in comparison to those identified as being of any other ethnic background (as was the case in the current study). Common terms used in the research literature include ethnic, national, or visible minority, and non-majority participants. While a nuanced discussion of such a complex issue is well beyond the scope of the current project, subsequent sections highlight important differences among various offender ethnic populations in relation to socio-demographic variables, developmental histories, patterns of offending, and deviant sexual interests. Therefore, examination of potential differences among offender ethnic groups represents an important avenue for further study.

For the purpose of the current research project, it was decided that the term White offender would be used to refer to any participant identified as being of Caucasian descent, while the term visible minority offender was used to refer to participants of any other ethnic background that were included in the study sample (including Aboriginal, Black, Asian, and Indian offenders). The Canadian government uses the term visible minority to refer to “persons, other than aboriginal peoples, who are non-Caucasian in race or non-white in colour” (Employment Equity Act, 1995, p. 2). For the purpose of the current project, the term visible minority offender also included individuals identified as being of Aboriginal descent. Overall, it is acknowledged that the choice of definitions for the current study represents an imperfect compromise, as it likely perpetuates issues of White normativity (i.e., “cultural norms and practices that make whiteness appear natural, normal, and right;” Ward, 2008, p. 564). However, these terms were deemed most useful for maintaining adequate definitional precision, and other potential definitions are arguably no better at ameliorating issues of ethnic normativity. Furthermore, terms such as White, Black, and Asian are reflective of the Canadian government’s current terminology in use for the most recent 2016 census (Statistics Canada, 2016).

2.1.3 Differences between White and visible minority offenders

Despite the disproportionate number of visible minority offenders within the Canadian prison population, there is a relative dearth of research examining similarities and differences between sex offender groups based on ethnic background. Still, that research which has been conducted has demonstrated a number of important differences between White and visible minority sex offenders in terms of demographic variables, social and developmental histories,

and patterns of offending, highlighting the implications such differences may have in the assessment and treatment of visible minority offenders.

2.1.3.1 Socio-demographic and psychological characteristics

While not focusing specifically on sex offenders, researchers have noted various social, demographic, and psychological differences among White and visible minority offenders in general. Specifically, in an examination of the Canadian federal offender population, Trevethan and Rastin (2004) found that visible minority offenders (excluding Aboriginal offenders) were younger at the time of admission, were less likely to be single or unemployed, and were more likely to have at least a grade 10 education in comparison to White offenders. In contrast, research on Aboriginal offenders has found that, while also younger at the time of admission (Brzozowski, Taylor-Butts, & Johnson, 2006; Wormith, Hogg, & Guzzo, 2015), they possessed less education (Brzozowski et al., 2006) and were more likely to have experienced poverty and family dysfunction (e.g., parental separation, domestic abuse) in comparison to non-Aboriginal offenders (Johnston, 1997; Trevethan, Auger, Moore, MacDonald, & Sinclair, 2002). An early study conducted by Borzecki, Wormith and Black (1988) examined differences between Aboriginal and non-Aboriginal psychiatric offenders on the Minnesota Multiphasic Personality Inventory (MMPI), a popular measure of personality and psychopathology. The authors found that, after controlling for IQ and level of education, the Aboriginal offenders' profiles indicated that they tended to be somewhat more guarded and less likely to acknowledge mental health symptoms, espoused more masculine interests and traditional gender roles, and endorsed less discomfort in social situations.

While the research examining socio-demographic differences among general ethnic offender populations is already limited, there is a particular lack of knowledge regarding such potential differences within sex offender populations (Babchishin, Blais, & Helmus, 2012). Still, researchers have noted some differences among these ethnic populations. For example, similar to general offender populations, visible minority sex offenders have been found to be younger at the time of admission (Cowburn et al., 2008a). Furthermore, in a comparison of Latino and White sex offenders in the United States, Carrasco and Garza-Louis (1997) found that Latinos demonstrated more rigid attitudes toward traditional gender roles. Subsequent research indicated that Latino sex offenders possessed significantly less education and were more likely to have

grown up in low socioeconomic households in comparison to Black and White offenders (Leguizamo, Peltzman, Carrasco, Nosal, & Woods, 2010).

Regarding Aboriginal sex offenders, researchers have noted several similarities with general Aboriginal offender populations. Specifically, Aboriginal sex offenders were significantly younger at the time of admission, had less education and higher rates of unemployment, and were more likely to have a history of substance abuse in comparison to non-Aboriginal sex offenders (Ellerby & MacPherson, 2002; Olver & Wong, 2006; Rastin & Johnson, 2002). Furthermore, Aboriginal sex offenders reported higher rates of parental separation, neglect, abandonment, and death, and were more likely to have been raised by extended family members (Ellerby & MacPherson, 2002; Leclair, 1996). Aboriginal sex offenders also reported higher rates of sexual abuse as children, and were more likely to have had knowledge of, or witnessed, domestic abuse and violations of sexual boundaries (Ellerby & MacPherson, 2002). Additionally, the family members of Aboriginal sex offenders demonstrated higher rates of substance abuse, and were more likely to have criminal histories in comparison to family members of Non-aboriginal offenders (Ellerby & MacPherson, 2002; Leclair, 1996). Finally, similar to the early study of Borzecki and colleagues (1988), Olver, Coupland, and Kurtenbach (2016) found differences in the MMPI profiles of Aboriginal sex offenders compared to non-Aboriginal sex offenders, with Aboriginal offenders endorsing higher levels of extroversion and impulsivity as well as more traditionally masculine interests.

2.1.3.2 Criminal offending

Researchers have noted a number of differences in patterns of offending among offender ethnic populations in general. Specifically, Trevethan and Rastin (2004) determined that visible minority offenders (excluding Aboriginal offenders) were less often incarcerated for sex offences, while also finding that they tended to have shorter sentence lengths and less extensive criminal histories. Furthermore, the authors found that visible minority offenders were at a lower risk to reoffend, and also rated lower on a number of dynamic criminogenic variables, including: community functioning, marital/family, mental health, and substance abuse issues. However, visible minority offenders were rated higher on the dynamic variables of both criminal associates and attitudes, while White offenders were rated as having a higher motivation for intervention and a higher reintegration potential. In contrast to other visible minority offender groups, Aboriginal offenders have been found to have lengthier criminal histories at the time of

admission (Dell & Boe, 2000; Holsinger, Lowenkamp, & Latessa, 2003), while Wormith and colleagues (2015) found that Aboriginal offenders had higher rates of general and violent recidivism. Finally, several authors have found that Aboriginal offenders were more likely to commit sexual offences in comparison to Non-Aboriginal offenders (Motiuk & Nafekh, 2000; Trevethan, Moore, & Rastin, 2002; Welsh, 2000).

Examining sex offender populations specifically, research has found that visible minority offenders were most likely to commit rape against adult victims, while White offenders more often committed sex offences against children (Cowburn et al., 2008a; Ellerby & MacPherson, 2002; Kirk, 1975; Leguizamo et al., 2010; Rastin & Johnson, 2002). Furthermore, Black sex offenders were more likely to use aggression and violence in the commission of their offences (Leguizamo et al., 2010; Kirk, 1975). Cowburn and colleagues (2008a) also found that visible minority sex offenders were less likely to access sex offender treatment while incarcerated, and had higher dropout rates; other researchers have reported similar findings (Ellerby & MacPherson, 2002; Smallbone, Crissman, & Rayment-McHugh, 2009). Researchers examining Aboriginal sex offenders have demonstrated that, similar to their non-sex offender counterparts, these offenders had lengthier criminal histories in comparison to non-Aboriginal sex offenders at the time of admission (Ellerby & MacPherson, 2002; Olver & Wong, 2006; Rastin & Johnson, 2002). Furthermore, Aboriginal sex offenders were more likely to use physical violence against their victims (Ellerby & MacPherson, 2002) and to be under the influence of drugs and/or alcohol during the commission of their sexual offence (Ellerby & MacPherson, 2002; Nahanee, 1996; Rastin & Johnson, 2002). Finally, Aboriginal sex offenders had higher rates of sexual recidivism (Rastin & Johnson, 2002; Rojas & Gretton, 2007; Williams, Vallée, & Staubi, 1997), violent recidivism (Rojas & Gretton, 2007), and general recidivism (Rastin & Johnson, 2002; Rojas & Gretton, 2007).

Of particular relevance to the current project, researchers have consistently demonstrated that visible minority sex offenders (including Aboriginal offenders) were significantly more likely to choose victims of the same ethnicity as themselves (this point will be further explicated in a subsequent section; Ellerby & MacPherson, 2002; Greenfeld, 1997; Nahanee, 1996).

2.1.3.3 Sexual deviance

Overall, White sex offenders appear to demonstrate significantly more sexual deviance in comparison to visible minority offenders. As noted above, White offenders in general were more

likely to commit sex offences in comparison to visible minority offenders (excluding Aboriginal offenders; Trevethan & Rastin, 2004). Among sex offender populations in particular, White sex offenders were more likely to commit offences against children in comparison to visible minority sex offenders (Cowburn et al., 2008a; Ellerby & MacPherson, 2002; Kirk, 1975; Leguizamo et al., 2010; Rastin & Johnson, 2002). Furthermore, in comparison to visible minority sex offenders, Leguizamo and colleagues (2010) found that White sex offenders were more likely to choose male victims and to engage in preparatory fondling and oral sex, and they also reported more pornography use. Similarly, while Aboriginal offenders in general were more likely to be incarcerated for sexual offences relative to non-Aboriginal offenders (Motiuk & Nafekh, 2000; Trevethan, Moore, & Rastin, 2002; Welsh, 2000), non-Aboriginal sex offenders were more likely to choose both child victims (Ellerby & MacPherson, 2002) and male victims (Ellerby & MacPherson, 2002; Nahanee, 1996; Rastin & Johnson, 2002; Rojas & Gretton, 2007). Furthermore, Ellerby and MacPherson (2002) noted that non-Aboriginal sex offenders more often reported arousal to depictions of children on television, the internet, and in movies, and were more likely to endorse masturbating to pictures of children. Finally, the authors found that non-Aboriginal sex offenders were more likely to report deviant sexual interests and paraphilias unrelated to their criminal charges (e.g., exhibitionism, sexual sadism, violent sexual fantasies). As the previous sections have delineated, important differences exist between White and visible minority sex offenders on a range of developmental, social, and criminal variables. Such differences may have important implications for accurately assessing deviant sexual arousal within visible minority sex offender populations, and little research has been conducted to examine the efficacy of phallometric assessments with ethnic minority participants (Murphy, Haynes, DiLillo, & Steere, 2001). In particular, there appears to be no research examining the potential impact of stimulus modality (i.e., visual or auditory) on subsequent penile arousal among minority ethnic groups.

2.1.4 Increasing use of auditory phallometric stimuli

As noted in section 1.8.7, several legal and ethical issues have recently been raised regarding the use of visual stimuli for conducting phallometric assessments. The fact that children could not provide informed consent to allow their photos to be used for assessment purposes, as well as the legal implications of clinicians being in the possession of child pornography, are of particular concern (Flak, Beech, & Fisher, 2006; Looman & Marshall, 2001;

Seto, 2001; Tudway & Darmoody, 2005). In response to such concerns, Seto (2001) noted that the increasing use of auditory stimuli will allow researchers and technicians to circumvent the issue of informed consent.

Aside from legal and ethical issues, the lack of uniform stimuli being employed in various labs has also been identified as a serious shortcoming of phallometric assessment (Barker & Howell, 1992; Howes, 1995; Marshall & Fernandez, 2000; Murphy & Barbaree, 1994; Seto, 2001). Some government organizations, including CSC, have increasingly employed auditory stimuli; the consideration of utilizing a single auditory stimuli set may represent an attempt to standardize phallometric assessment procedures across institutions (V. Kyle, personal communication, August 24, 2010).

As described in section 1.8.2, auditory stimuli are generally found to be comparable to visual stimuli in the assessment of deviant arousal (Abel et al., 1981; Looman & Marshall, 2001), while auditory stimuli appear to be more effective for assessing arousal among incest offenders (Lang, Black, Frenzel, & Checkley, 1988; Fernandez & Marshall, 2004, as cited in Marshall, 2006). As noted previously, such findings indicate that auditory stimuli may be sufficiently vague as to allow incest offenders to imagine their ideal victims to whom they are sexually attracted, whereas visual stimuli depicting unfamiliar children may preclude arousal (Marshall, 2006); this same phenomenon may also extend to visible minority offender populations.

2.1.5 The influence of ethnicity on sexual arousal

In general, sex offenders have been found to be more likely to commit sexual offences against individuals of the same ethnicity as themselves (Greenfield & Smith, 1999). Specifically, researchers have found that the victims were of the same ethnicity as the offender in a substantial majority of reported cases (i.e., 79% to 88%; Ellerby & MacPherson, 2002; Greenfeld, 1997; Nahanee, 1996). It is possible that this finding could be partly explained by a greater availability of ethnically similar victims within the community in which visible minority offenders commit their offences; this would include the proximity of immediate and extended family members, who are often the victims of sexual abuse. However, it is pertinent to note that anthropological research has suggested that a similarity effect exists among humans in general, in that members of ethnic groups tend to find ethnically similar individuals to be more attractive in comparison to members of other groups (Liu, Campbell, & Condie, 1995; Swami, Einon, & Furnham, 2009).

As such, it is possible that visible minority offenders are more sexually attracted to members of their own race, and therefore they are more inclined to choose ethnically similar victims, regardless of availability. Thus, similar to research findings with incest offenders, visible minority offenders may show greater penile response to auditory stimuli in comparison to visual stimuli (which tend to feature images of White individuals), as it is sufficiently vague that they can imagine their ideal victim (which may include being of the same ethnic background).

It is important to note that Murphy and colleagues (2001) reported lower responding among their sample of Black adolescent sex offenders while using auditory stimuli, with the authors acknowledging the possibility that “there is some interaction between cultural background and the overall assessment process that leads to more suppression in the laboratory for nonmajority culture subjects” (p. 101). Still, the authors acknowledged that they had a small sample of African American participants ($n = 37$), and stated that future research needs to begin to examine potential response differences among nonmajority ethnic groups. As Merdian and Jones (2011) pointed out,

[N]ot every exemplar of a category will inevitably lead to an arousal reaction, just as a heterosexual nonoffender would not think of every adult female as equally attractive.

Individuals will vary in their preference for gender, hair and skin color and physical build, yet are expected to respond comparably to a standard set of stimuli (p. 144).

Unfortunately, very little research has been conducted in an attempt to elucidate potential differences in PPG responding between White and visible minority sex offenders.

2.2 Purpose and Hypotheses for Study 1

The purpose of the current study was to determine if auditory phallometric stimuli allowed for more accurate assessment of deviant sexual interests among visible minority sex offenders relative to visual stimuli. As such, visible minority offenders’ penile responses to auditory and visual stimuli were compared in order to determine if they in fact showed greater deviant responding to auditory stimuli. Furthermore, the investigation aimed to determine if visible minority offenders exhibited significantly lower levels of penile responding in comparison to White offenders when visual stimuli were used. Finally, the study was conducted to determine if visible minority and White offenders’ rates of responding were more similar when auditory stimuli were used.

With this in mind, several hypotheses were proposed for the current study. First, given that auditory stimuli tend to correlate well with visual stimuli in assessing deviant sexual arousal, it was hypothesized that there would be no significant difference in deviant responding as measured by phallometric assessment when comparing the visual and auditory stimulus sets for White offenders, as the offenders were either being shown pictures of their presumably ideal ethnic victims (i.e., White individuals) or were listening to vignettes in which they were able to imagine their ideal ethnic victim. In contrast, it was hypothesized that visible minority offenders would demonstrate significantly greater penile responses to auditory stimuli in comparison to visual stimuli. This hypothesis followed from Marshall's (2006) finding that incest offenders responded significantly more often to auditory stimuli (as they presumably were able to imagine their ideal victim), as well as research in the anthropological field finding that humans generally view members of their own ethnic background to be more attractive. Similarly then, visible minority offenders were expected to show significantly greater responding to auditory stimuli, as they could imagine their ideal victim (i.e., likely someone of the same ethnicity).

Third, it was hypothesized that White offenders would exhibit significantly greater penile responding to visual stimuli in comparison to visible minority offenders, as the slides were likely closer representations of the White offenders' ideal victim (i.e., someone of the same ethnicity). Finally, it was hypothesized that there would be no significant difference in deviant responding to auditory stimuli when comparing visible minority and White sex offenders, as all groups of offenders would be able to imagine their respective ideal victims.

2.3 Access to Archival Data

As a preamble to Studies 1, 2, and 3, the following commentary is offered to explain the variations of participants across studies, but from a common database. As explicated further in section 2.4.3.1, the current project utilized archival data previously collected at the Ontario Regional Treatment Centre (RTC) located in Kingston, Ontario, Canada. Each of the three studies that comprised the project utilized somewhat different subsamples from the overall sample of offenders that comprised the dataset. This was necessitated by the specific aims of each study and the data that had been collected for each participant. For example, while rapists were included in the overall sample, they were excluded from the Study 1 subsample because visual rape stimuli were not used in the assessment protocol and Study 1 was designed specifically to compare visual and auditory stimuli. Furthermore, only those offenders who had

been administered the relevant psychometric measures could be included in Studies 2 and 3 given the aims of these studies. Specifically, only offenders who had been administered the Paulhus Deception Scales and some form of intelligence testing could be included in Study 2 and only offenders who had been administered the Multiphasic Sex Inventory could be included in Study 3. Thus, while the overall sample represented the total RPC offender dataset, the subsamples utilized for each study were not identical.

2.4 Methodology

2.4.1 Participants

The sample for the current study included 104 sexual offenders. All of the participants were adult male offenders who were serving federal prison sentences for contact sex offences (i.e., actual or attempted physical contact with a victim). Based on their criminal history, all of the offenders were designated as either child molesters (exclusive) or mixed offenders (i.e., those who had committed sexual offences against both children and adults).¹ Regarding their sexual offence history, the overall sample was comprised largely of child molesters (80.8%, $n = 84$), with the remaining being mixed offenders (19.2%, $n = 20$). Regarding ethnicity, the sample was predominantly comprised of White offenders (84.6%, $n = 88$). Visible minority offenders included Aboriginal offenders (7.7%, $n = 8$), Black offenders (4.8%, $n = 5$), and Asian offenders (1.0%, $n = 1$); as well, the ethnicity of two offenders (1.9%) was classified as “other” and included individuals who did not belong to any of the aforementioned ethnic groups. A more detailed description of the participants is provided in the results section.

2.4.2 Measures

2.4.2.1 Penile Plethysmography (PPG)

As part of a standard assessment battery, all of the offenders in the current research project participated in a phallometric assessment. The phallometric apparatus, stimuli, and testing procedures have been described in previous publications (Looman & Marshall, 2001; Looman & Marshall, 2005); the following description of testing materials was adapted from these articles.

2.4.2.1.1 Apparatus. Penile circumference was measured using a DM Davis mercury-in-rubber strain gauge. Changes in penile circumference were detected using a Parks Electronic

¹ While the overall dataset was also comprised of rapists, a lack of visual rape stimuli precluded their inclusion in the current study because the specific hypotheses concerned differential responding based on stimulus modality.

Model 270 Strain Gauge Plethysmograph, with mercury conductance decreasing as the mercury was stretched by increases in penile circumference. Readings from the plethysmograph were outputted in millimeter stretch to a Hewlett Packard 9000 series computer.

2.4.2.1.2 Stimuli. The auditory stimuli were comprised of 22 audiotaped vignettes (Quinsey & Chaplin, 1988). Half of the stimuli depicted an adult male interacting with a female adult or child, while the remaining half depicted an adult male interacting with a male adult or child. Within each set of stimuli, two vignettes depicted consensual sexual activity with an adult, two vignettes depicted sexual interactions with a passively cooperating child, two vignettes depicted interactions with a child is verbally coerced into sexual activity, two vignettes depicted the sexual assault of a child involving physical violence, two vignettes involved nonsexual assault of a child, and one vignette depicted a neutral (nonsexual, nonassaultive) activity (Looman & Marshall, 2001).

The visual stimuli consisted of 21 colour pictures of single, nude males and females. Six of the stimuli depicted adults (three each of males and females), six stimuli depicted pubescent children (three each of males and females), six stimuli depicted prepubescent children (three each of males and females), and three stimuli were neutral (i.e., scenery) slides. The slides depicting prepubescent and pubescent children ranged in age from 3 to 11 years in 2-year increments, and adolescents ranging in age from 12 to 14 years in 1-year increments, respectively. The slides depicting adults ranged in age from 16 to 24 years in 2-year increments (Looman & Marshall, 2001).

2.4.3 Procedure

2.4.3.1 Recruitment and data collection

The current research project was archival in nature, using data previously collected at the Ontario Regional Treatment Centre (RTC), a psychiatric facility that was originally located within the grounds of a maximum security penitentiary in Kingston, Ontario, Canada. In general, offenders who were placed at the RTC were those that presented with significant mental health issues requiring specialized services that are typically not available at regular federal institutions. Sexual offenders admitted to the RTC were identified as high risk/high need offenders who required an intensive level of specialized service designed to address unique sexual recidivism risk factors. All of the offenders from the current sample participated in the RTC Sex Offender Treatment Program, a high intensity program designed to address criminogenic domains in high

risk/high need sex offenders. The program lasted approximately seven months, and included various treatment protocols, including heterosocial skills training, assertiveness skills training, anger management, arousal reconditioning, empathy enhancement, and relapse prevention (Looman, Abracen, & Nicholaichuk, 2000). As a requisite component of the program, participants completed a standardized pre/post assessment battery, which included interviews, phallometric testing, and the administration of various psychometric measures. The date range for data collection was November 1992 to July 2007.

2.4.3.2 PPG testing procedure

At the outset of the PPG testing session, participants were seated in a private sound-attenuated room, and were provided with instructions on how to attach the strain gauge to their penis. After the experimenter left the room, the participants were instructed to remove their pants and underwear and seat themselves on a towel-covered chair, and to then fit the strain gauge midway along the longitudinal axis of the shaft of their penis. Participants were then asked to direct their attention to the screen or place the headphones on their ears and to make themselves ready for the presentation of the stimuli. Stimulus presentation began after a five minute rest period during which time baseline sexual arousal was recorded. Each auditory stimulus was presented for approximately two minutes, followed by an inter-stimulus interval period. Each visual stimulus was presented for approximately one minute. Subsequent stimuli were not presented until baseline penile arousal was re-established during the interval period (Looman & Marshall, 2001; Looman & Marshall, 2005). Readings began 30 seconds prior to stimulus onset, with penile circumference readings continuing to be taken every 100 milliseconds and ending 30 seconds after stimulus termination. All participants were administered both visual and auditory stimuli; both sets of stimuli were ordered randomly but presented in the same order for each participant.

2.4.3.3 Data preparation

2.4.3.3.1 PPG variables. The phallometric testing data utilized for the current research project reflected participants' pre-treatment assessment scores. The original researchers had calculated percent of full erection (PFE) scores from participants' raw peak-mm stretch readings based on actual achieved full erection during testing. Participants who did not achieve a full erection during the testing session were asked to do so subsequent to the completion of the assessment. An average full erection value was used as an estimate for those participants who

were unable to achieve a full erection (Looman, 2000). The current researcher calculated two PFE-based outcome variables (i.e., difference scores and ratio scores) for the visual and auditory stimuli.²

Differential scores were calculated by taking each participant's mean responding within a deviant stimulus category and subtracting their mean responding to the corresponding appropriate stimuli. Deviant stimulus categories for the visual stimuli set included prepubescent females, prepubescent males, pubescent females, and pubescent males, while appropriate stimulus categories included adult females and adult males; each category contained three stimuli. Deviant stimulus categories for the auditory stimuli set included prepubescent females and prepubescent males; for both gender types there were two stimuli each within three categories of deviant sexual behaviour: passive, coercive, and sexually violent. The appropriate auditory stimuli included two stimuli each of either consenting sex with an adult female or consenting sex with an adult male.

For both the visual and auditory stimulus sets, the choice of appropriate stimuli (i.e., either adult female or adult male stimuli) to use for each differential calculation was that which corresponded to the sex of the victim within the deviant stimulus category. For the visual stimuli, a participant's mean PFE responding to adult female stimuli was subtracted from his mean responding to prepubescent (or pubescent) female stimuli, while his mean responding to adult male stimuli was subtracted from his mean responding to prepubescent (or pubescent) male stimuli. Therefore, a total of four differential scores were calculated for the visual stimuli. For the auditory stimuli, a participant's mean PFE responding to adult female stimuli was subtracted from his mean responding to prepubescent female stimuli (either passive, coercive, or sexually violent). Similarly, a participant's mean PFE responding to adult male stimuli was subtracted from his mean responding to prepubescent male stimuli (either passive, coercive, or sexually violent). Therefore, a total of six differential scores were calculated for the auditory stimuli.

An identical process to that outlined above was carried out in order to create the PFE ratio scores, however rather than subtracting mean appropriate responding from mean deviant responding, participants' mean deviant responding was divided by their mean appropriate

² It is noted here that some PFE differential and ratio scores had been calculated by the original researchers who compiled the dataset; however these calculations had not been carried out for the entire sample or for all stimulus types (i.e., auditory stimuli). As such, the current researcher calculated (or recalculated) the variables for all participants.

responding. For both the differential and ratio scores, increasing values indicated stronger deviant responding. Finally, in order to capture offenders' strongest deviant responding in an efficient manner, overall "hybrid" PPG outcome variables were created. For the visual stimuli, the differential and ratio hybrid variables utilized each participant's strongest responding to any of the child stimuli (i.e., male/female, prepubescent/pubescent). Similarly for the auditory stimuli, the hybrid variables utilized each participant's strongest responding to any of the child stimuli (i.e., male/female, passive/coercive/sexually violent depiction). As an example using auditory stimuli, the data point chosen for inclusion for participant A may have been his PFE score (ratio or difference) to the sexually violent vignette involving a female child, while the data point chosen for inclusion for participant B may have been his PFE score to the passive vignette involving a male child.

The decision to use differential and ratio scores was based on a review of current practices in the published empirical literature (e.g., Lykins et al., 2010; Merdian & Jones, 2011), as well as the objectives of the current researcher. Specifically, the use of such scores reflected a desire to report both a measure of any deviant sexual interest (i.e., difference scores), as well as a measure of deviant sexual preference (i.e., ratio scores). Following from this, PFE scores were chosen as they lend themselves to convenient differential and ratio calculations. While z-scores possess many advantages (see section 1.8.3) and can be reported as difference scores, they do not easily lend themselves to the calculation of ratio scores (nor is the current researcher aware of any studies that have utilized such scores). Furthermore, the use of ratio scores derived from peak responding has also been noted to possess several advantages. Specifically, such scores remain consistent following habituation to the phallometric procedure, and also allow for meaningful comparisons between participants (Merdian & Jones, 2011). Ratio scores are also useful given that they indicate the strength of offenders' deviant responding relative to neutral or non-deviant responding, which is informative in the prediction of sexual recidivism (Seto, 2001). For these reasons, PFE-based scores were determined to be most advantageous for the purposes of the current project.

Finally, a note regarding inclusion criteria based on phallometric responding is warranted here. Specifically, it was decided to retain all offenders for the purpose of data analysis, regardless of their level of phallometric responding. As explicated in section 1.8.5, many researchers have excluded low responders from data analysis in an attempt to mitigate issues of

low and fake responding. However, several issues with this practice have been noted, including the lack of an agreed cut-off point for low responding, as well as the removal of a large percentage of participants from analysis and subsequent inflation of group differences (Looman, Abracen, Maillet, & DiFazio, 1998; Murphy & Barbaree, 1994). Furthermore, some researchers have found that retaining low responders for data analysis does not affect discriminative or predictive validity (Harris et al., 1992). In addition, retaining all offenders for analysis is arguably a more ecologically valid approach, as the issue of low responding is one that is frequently faced by practicing clinicians. Finally, omitting low responders would have decreased power as a result of reducing the sample size. For these reasons, it was decided to retain all offenders for the purpose of data analysis.

It is noted here that the same general data collection process, PPG inclusionary criteria, testing procedure, and outcome variable calculations also applied to Studies 2 and 3. As such, much of the above information is not repeated in subsequent chapters.

2.4.4 Analyses

Frequency and descriptive statistics were calculated for the White and visible minority offender groups, as well as for the overall sample. Chi-square analyses and independent samples t-tests were used to examine potential differences between White and visible minority offenders on a variety of socio-demographic, mental health, criminal history, and current treatment-related characteristics. Pearson's correlations were used to initially identify potential associations between ethnicity and phallometric responding. Finally, a 2 x 2 mixed factorial ANOVA design was used in order to directly test the hypotheses of the current study. Participant race was set as the between-subjects variable (i.e., White versus visible minority offenders), while stimulus modality served as the within-subjects variable (i.e., visual versus auditory stimuli). The dependent variable was participants' penile responding as measured by phallometric assessment. As noted in the previous section, separate analyses were conducted in which penile responding was operationalized using either hybrid PFE ratio or differential scores. Analyses examined simple effects of the race x stimulus interaction.

2.4.5 Ethics

The current project received ethical approval from the Research Ethics Board at the University of Saskatchewan, as well as from the CSC National Headquarters Research Branch (see Appendices A and B, respectively). All of the participants from the current sample provided

free and informed written consent at the time of original data collection to be admitted to the RTC and to participate in the Sex Offender Treatment Program; participants also gave their written consent to allow their assessment and treatment data to be used for research purposes (see Appendix C). Participants provided separate written consent to participate in phallometric testing and to allow their data to be used for research purposes (see Appendix D). Participants were informed that the results of their participation would be kept strictly confidential, and that their testing results would be aggregated with data collected from other participants before being used for analysis and publication. Participants were allowed to withdraw their consent from the treatment program, phallometric testing, and/or research participation at any time. The de-identified electronic datasets were securely transmitted to the current researcher (T. Kurtenbach) for the purpose of data cleaning and analysis. The dataset was stored on a password-protected computer that could only be accessed by the current researcher. The same ethical approval process applied to Studies 2 and 3 and is not repeated in subsequent chapters.

2.5 Results

2.5.1 Descriptive results

As can be seen in Table 2.1, White and visible minority offenders differed in several important domains. First, there were significantly more child molesters among the White offender sample in comparison to the visible minority offender group, who consisted of a larger proportion of mixed offenders. Regarding offence characteristics, visible minority offenders were significantly younger when they committed their current offence, while White offenders had a significantly greater number of federal incarceration periods. In particular, White offenders had significantly more convictions for nonviolent offences. The offender groups also differed in regard to current treatment-related domains. Specifically, White offenders were, on average, significantly older than the visible minority offenders at the time of assessment, and a greater proportion of these offenders successfully completed the RTC treatment program.

As shown in Table 2.2, the results of the Pearson's correlations indicated that ethnicity was not significantly correlated with any of the PPG outcome variables. Consistent with the initial t-test analysis age was significantly correlated with ethnicity, however it was only correlated with the auditory differential score. As would be expected, all of the PPG outcome variables were significantly and strongly correlated with one another.

Table 2.1
Study 1 Sample Characteristics

Variable	Overall		White		Visible minority		<i>t</i> or χ^2
	<i>n</i>	<i>M</i> (<i>SD</i>) or %	<i>n</i>	<i>M</i> (<i>SD</i>) or %	<i>n</i>	<i>M</i> (<i>SD</i>) or %	
<u><i>Socio-demographics</i></u>							
Completed at least grade 12	90	16.7	75	16.0	15	20.0	.14 [†]
Ever married	94	58.5	79	60.8	15	46.7	1.03
History of drug abuse	96	49.0	82	47.6	14	57.1	.44
History of alcohol abuse	97	70.1	83	71.1	14	64.3	.26 [†]
Sexually abused as child	95	66.3	81	66.7	14	64.3	.03 [†]
Physically abused as child	92	63.0	81	64.2	11	54.5	.39 [†]
Witnessed sexual abuse as child	63	36.5	55	34.5	8	50.0	.72 [†]
Witnessed physical abuse as child	77	58.4	69	59.4	8	50.0	.26 [†]
Age at first exposure to sex	83	13.9 (3.8)	70	14.0 (3.9)	13	13.2 (3.6)	.76
<u><i>Mental Health</i></u>							
No. prior psychiatric admissions	71	1.5 (1.9)	61	1.6 (2.0)	10	1.0 (1.2)	.87
Previous psychiatric treatment	87	43.7	72	47.2	15	26.7	2.13
Diagnosed personality disorder	81	50.6	68	50.0	13	53.8	.07
Diagnosed psychosis	81	8.6	68	8.8	13	7.7	.02 [†]
Diagnosed mood disorder	81	3.7	68	4.4	13	0.0	.60 [†]
Diagnosed substance abuse disorder	81	8.5	68	8.8	13	7.7	.02 [†]
Diagnosed paraphilia	81	28.4	68	30.9	13	15.4	1.29 [†]
<u><i>Criminal History</i></u>							
Age at first arrest	104	20.7 (7.4)	88	20.6 (7.4)	16	21.4 (7.2)	-.43
No. federal incarcerations	104	1.5 (1.0)	88	1.7 (1.0)	16	1.0 (.0)	5.97***
No. sexual convictions	104	5.3 (6.1)	88	5.5 (6.3)	16	4.4 (5.4)	.66
No. violent convictions	104	6.7 (5.9)	88	6.9 (6.1)	16	5.6 (5.3)	.82
No. nonviolent convictions	104	12.0 (13.2)	88	12.9 (13.9)	16	6.3 (6.3)	1.88**
<u><i>Current Offence-related</i></u>							
Age at offence	102	31.4 (9.8)	86	32.6 (9.9)	16	24.7 (6.4)	3.10***
Length of sentence (years)	84	5.6 (3.5)	69	5.5 (3.7)	15	6.1 (2.6)	-.61
Drugs/alcohol related to offence	87	54.0	75	53.3	12	58.3	.10
<u><i>Offender Classification</i></u>							
Child molester	104	80.8	88	85.2	16	56.3	7.32*, †, ‡
Mixed	104	19.2	88	14.8	16	43.8	7.32*, †, ‡
<u><i>Treatment-related</i></u>							
Age at assessment	104	39.1 (11.1)	88	40.7 (11.0)	16	30.25 (6.3)	3.67***
No. prior PPG assessments	81	1.2 (1.2)	68	1.3 (1.2)	13	.5 (.7)	2.34**
Admits to deviant fantasies	73	57.5	62	61.3	11	36.4	2.38 [†]
No. prior SO programs completed	84	.8 (1.0)	71	.8 (1.1)	13	.5 (.8)	1.19
Post-PPG txt completion	73	76.7	63	81.0	10	50.0	4.63*, †, ‡

* Significant ethnic group difference at the $p \leq .05$ level. ** $p \leq .01$. *** $p \leq .001$.

† Chi-square contained at least one cell with expected count < 5 .

‡ Fisher's exact test also significant.

Table 2.2

Means, Standard Deviations, and Intercorrelations for Ethnicity and Four PPG Outcome Variables

	<i>M (SD)</i>	1	2	3	4	5	6
1. Ethnicity	—	—					
2. Age	39.1 (11.1)	-.31**	—				
3. Visual stimuli ratio score	1.63 (1.09)	-.14	.05	—			
4. Visual stimuli differential score	4.51 (10.15)	.02	.01	.75***	—		
5. Audio stimuli ratio score	2.42 (1.88)	-.05	-.09	.44***	.52***	—	
6. Audio stimuli differential score	12.83 (16.85)	.03	-.21*	.35***	.46***	.77***	—

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

2.5.2 Hypothesis testing

Tables 2.3 and 2.4 highlight the results of the mixed ANOVA analyses, while Figures 2.1 and 2.2 present graphical representations of offenders' mean PPG responding across stimuli modalities using PFE ratio and differential scores, respectively. As can be seen, the results of the analyses using ratio and differential scores are quite similar. Specifically, for both sets of analyses there was a main effect of stimulus modality, with both White and visible minority offenders demonstrating significantly greater deviant responding to the auditory stimuli. There was no main effect of ethnicity, nor was the interaction effect significant for either analysis. The initial t-test comparisons examining various demographic variables highlighted two important differences between White and visible minority offenders that could have impacted the above results. Specifically, White offenders were found to be both significantly older at the time of assessment and (perhaps by extension) to have a significantly greater number of previous phallometric assessments; both of these factors have been noted in the existing literature as being important to consider when interpreting phallometric test results (issues of habituation were discussed in section 1.8.5, while the influence of age on phallometric assessment is the focus of study 3). Therefore, the previous mixed ANOVA analyses were repeated with age and number of previous phallometric assessments entered as covariates (ANCOVA). Controlling for both of these variables did not significantly impact any of the initial findings and as such these analyses are not reported here. The implications of the results are discussed below.

2.6 Discussion

2.6.1 Group demographic differences

The initial chi-square analyses and independent samples-t-tests highlighted several important differences between White and visible minority offenders that are largely consistent with previous literature. First, visible minority offenders were significantly younger when they committed their offence (and subsequently younger at the time of admission), a finding that has been demonstrated in several previous studies (Brzozowski et al., 2006; Cowburn et al., 2008a; Ellerby & MacPherson, 2002; Olver & Wong, 2006; Rastin & Johnson, 2002; Trevethan & Rastin, 2004). Visible minority offenders were also significantly more likely to have committed offences against adults in comparison to White offenders, which is again similar to the findings of other researchers (Cowburn et al., 2008a; Ellerby & MacPherson, 2002; Kirk, 1975; Leguizamo et al., 2010; Rastin & Johnson, 2002). Furthermore, in line with the findings of

Table 2.3

Analysis of Variance Results for Ethnicity and Stimulus Modality on PPG Ratio Score Outcome Variables

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Between subjects						
Ethnicity	1	4.76	4.76	1.42	.235	.01
Error 1	102	341.15	3.35			
Within subjects						
PPG Modality	1	19.69	19.69	14.15	.000	.12
Ethnicity x Modality	1	.62	.62	.45	.505	.00
Error 2	102	141.94	1.39			

Table 2.4

Analysis of Variance Results for Ethnicity and Stimulus Modality on PPG Differential Score Outcome Variables

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Between subjects						
Ethnicity	1	15.21	15.21	.06	.809	.00
Error 1	102	25031.75	258.06			
Within subjects						
PPG Modality	1	2416.64	2416.64	21.287	.000	.18
Ethnicity x Modality	1	108.17	108.17	.95	.331	.01
Error 2	102	11012.33	113.53			

Figure 2.1
Mean PPG Ratio Responding for White and Visible Minority Offenders across Stimulus Modalities

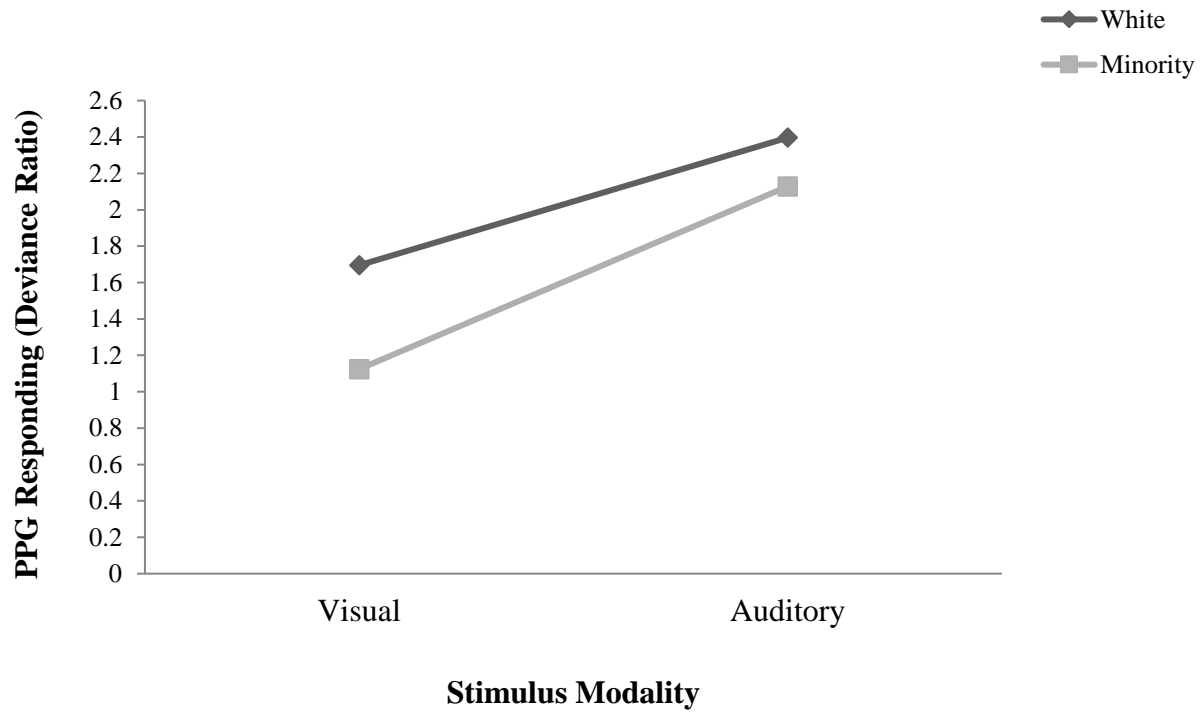
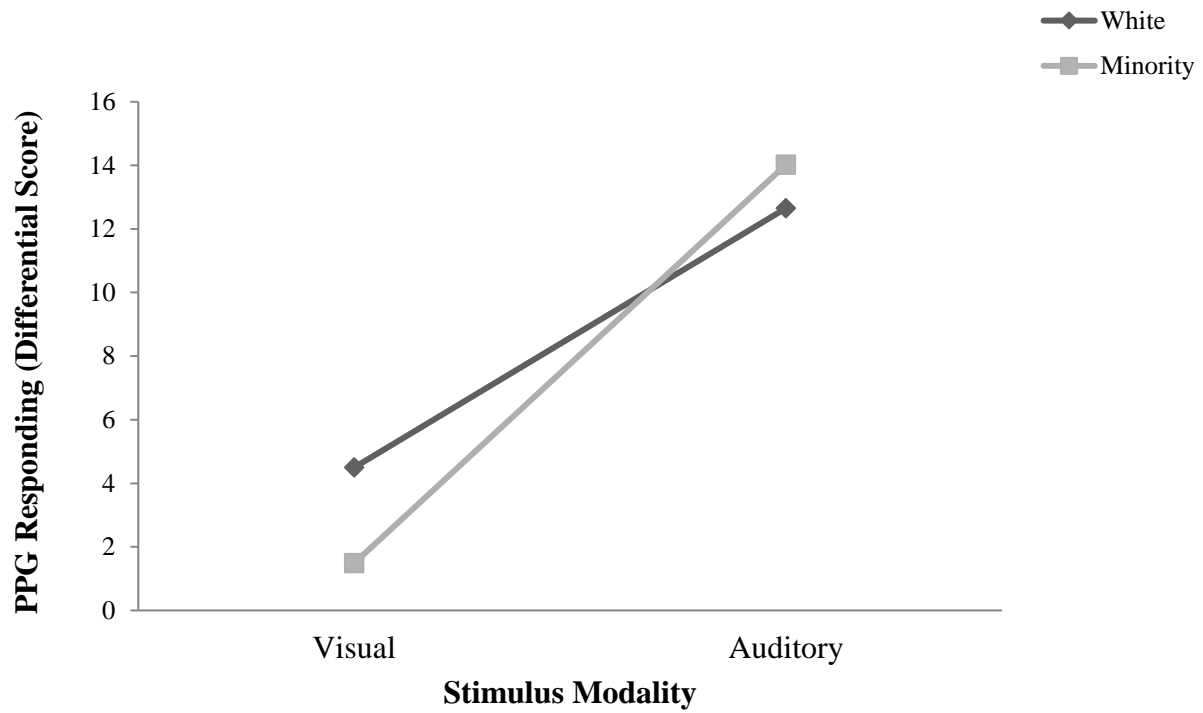


Figure 2.2

Mean PPG Differential Responding for White and Visible Minority Offenders across Stimulus Modalities



Trevethan and Rastin (2004), White offenders from the current sample had significantly lengthier criminal histories (primarily accounted for by a greater number of non-violent convictions). This finding may be partly explained by the fact that White offenders, as a group, were significantly older than the visible minority offenders, and thus had a relatively extended opportunity within which to engage in criminal behaviour. Finally, visible minority offenders from the current sample were significantly less likely to successfully complete sex offender treatment programming, which is also consistent with previous research (Cowburn et al., 2008a; Ellerby & MacPherson, 2002; Olver, Stockdale, & Wormith, 2011; Smallbone, Crissman, & Rayment-McHugh, 2009).

2.6.2 Phallometric responding

In terms of the current hypotheses, the results of the mixed ANOVA analyses pointed to similar results with the use of either PFE ratio or differential scores, as only the second and fourth hypotheses were supported for both analyses. Specifically, visible minority offenders demonstrated significantly greater deviant responding with auditory stimuli relative to visual stimuli, and there was no significant difference in deviant responding to auditory stimuli between White and minority offenders. However, the first and third hypotheses were not supported, as White offenders demonstrated significantly greater deviant responding with auditory stimuli relative to visual stimuli, while they did not demonstrate significantly greater deviant responding to visual stimuli in comparison to minority offenders. These results would appear to suggest that, in line with the second and fourth hypotheses, both White and visible minority offenders may have imagined their ideal victim when being exposed to auditory phallometric stimuli, while exposure to visual stimuli precluded this ability (and thus stronger deviant responding was found with the auditory stimuli). Furthermore, given the lack of support for the first and third hypotheses, it is possible that a variety of victim characteristics outside of ethnicity (e.g., hair colour and/or style, physical build) were also influencing participants' responding, ultimately resulting in overall lower deviant responding being demonstrated with visual stimuli among both White and minority offenders. Finally, it is possible that the high risk offenders who comprised the current sample presented with a particularly high level of deviant sexual interests in general, which may have masked any potential influence of ethnicity between White and visible minority offenders.

Overall, the current findings would appear to suggest that the use of auditory stimuli is comparable, or perhaps even superior, to the use of visual stimuli in assessing deviant sexual responding among sex offenders in general. While the difference was not significant within the current sample, it is noteworthy that visible minority offenders demonstrated less deviant responding to visual stimuli relative to White offenders. As such, future research may further elucidate if the use of auditory stimuli is particularly warranted in the assessment of ethnic minority offenders; however no such conclusions can be drawn at this time based on the results of the current study.

2.6.3 Strengths of the current study

One of the primary strengths of the current study was simply that it addressed an identified lacuna in the existing empirical literature regarding visible minority sex offenders (Babchishin, Blais, & Helmus, 2012; Horrell, 2008). In particular, the comprehensive assessment protocol that was utilized at the RTC allowed for the examination of a wide array of demographic, mental health, offence-specific, and treatment-related characteristics among visible minority offenders that have received limited empirical attention to date. Furthermore, this study appears to be one of the few to examine sex offenders' differential responding to visual and auditory stimuli, as well as to utilize different outcome measures (i.e., ratio and difference scores).

2.6.4 Limitations and avenues for future research

Although the current study provided important insights into the unique characteristics of visible minority sex offenders, it was also limited by the small number of these offenders that were included in the sample. Most importantly, the sample size was not sufficiently large enough to allow for individual examinations of the various ethnic groups that comprised the visible minority sample. This finding is particularly noteworthy given that previous research, as delineated in previous sections, has highlighted salient differences between Aboriginal offenders and other visible minority offender groups (e.g., Aboriginal offenders possess less education, are more likely to be unemployed and have a history of substance abuse, have lengthier criminal histories, and are more likely to recidivate in a general, violent, or sexual manner; Ellerby & MacPherson, 2002; Olver & Wong, 2006; Rastin & Johnson, 2002; Rojas & Gretton, 2007; Williams, Vallée, & Staubi, 1997; Wormith et al., 2015). Such differences suggest that Aboriginal offenders present with a different emphasis in criminogenic needs, as well as unique

unmeasured needs that may be separate from both White offenders and other visible minority groups. Furthermore, the small sample of visible minority offenders may have resulted in a lack of sufficient statistical power that in turn precluded the finding of additional significant differences between White and minority offenders. This is important given that, as can be seen in Figure 2.2, a significant interaction effect may have been found using differential scores had the sample size been larger. As such, replications of the current study using larger sample sizes would be illuminating. In particular, it will be prudent for subsequent researchers to employ different stimulus modalities, as the results of the current study highlighted significant differences in penile responding dependent upon the use of either visual or auditory stimuli. Similarly, it is possible that other variables, as yet fully accounted for, impacted such differential responding to stimuli types. As such, additional research is required in order to further elucidate relevant factors that may influence varying levels of arousal to different stimulus modalities.

The current study only involved offenders who had a history of contact offences against children (and thus only utilized stimuli designed to assess arousal to children), and as such the results cannot be generalized to offenders identified as exclusive rapists. Therefore, future research could attempt to extend the current findings to samples of rapists using relevant stimuli. Furthermore, the current study employed specific visual and auditory stimulus sets, and as such subsequent research should determine if similar results are found utilizing alternative stimulus sets that have been developed by other researchers.

Finally, although not an explicit focus of the current study, it is noteworthy that visible minority offenders from the current sample were significantly less likely to successfully complete treatment (see Table 2.1). Perhaps one of the most significant imperatives for future research will be the examination of those factors that influence lower rates of treatment completion among visible minority offenders. While it has been noted that there is a dearth of empirical literature examining the effectiveness of sex offender treatment for ethnic minority offenders (Horrell, 2008), researchers have indicated potential barriers to successful treatment completion among these populations. Specifically, it has been suggested that the majority of visible minority offenders have experienced heavy policing in their communities, typically characterized by negative interactions with police officers. As a result of such experiences, visible minority offenders tend to develop ‘survival strategies’ that they rely on both in the community and within institutional settings, which includes not engaging with correctional staff

(such as treatment providers; Cowburn, Lavis, & Walker, 2008b; Wilson, 2003). Second, the detailed discussion of offenders' sexually abusive behaviour typically forms the cornerstone of most sex offender treatment programs. However, individuals from various non-Western societies often experience cultural and/or religious constraints regarding the discussion of sexual activity and/or criminal behaviour that is more pervasive than that experienced by those from Western societies. For example, Muslim teachings forbid the discussion of criminal offences (Cowburn et al., 2008b). As a result of the shame and fear experienced due to such ethnic and religious constraints, minority offenders are often even more reticent to discuss their sexual offending behaviour relative to other offenders (Droisen, 1989; Gilligan & Akhtar, 2006; Olumoroti, 2008); this of course represents a significant impediment to successful treatment completion.

Cowburn and colleagues (2008b) have also posited that Western conceptualizations of individuality and autonomy are less applicable to individuals from cultural backgrounds that emphasize family and community connections. As a result, visible minority offenders may view themselves as incapable of meaningful change without the support and guidance of their family and the broader community. It is noted that themes of self-agency underpin both the Risk-Need-Responsivity (RNR) model of offender rehabilitation and cognitive-behavioural therapy (CBT) approaches to offender treatment, with these representing the most prevalent models of offender treatment programs (Andrews, Bonta, & Wormith, 2011). In this vein, the RNR model has been criticized for failing to adequately account for social or cultural influences that may impact treatment motivation, engagement, and completion (Ward & Maruna, 2007), although Andrews and colleagues (2011) have asserted that the expanded RNR model takes into consideration such factors, as per specific responsivity (see below).

Briefly, the RNR model rests on three general principles that inform effective offender rehabilitation. The three principles of RNR are outlined as follows: 1) Risk principle – recidivism is most effectively reduced when the level of treatment services is proportional to the offender's risk to reoffend (i.e., high risk offenders require intensive services, while low risk offenders require minimal, if any, intervention); 2) Need principle – correctional treatments should target criminogenic needs that have been demonstrated to be directly linked to criminal behaviour (e.g., antisocial personality traits, procriminal attitudes and acquaintances, substance abuse), while de-emphasizing non-criminogenic factors (e.g., low self-esteem, poor physical health); and, 3) Responsivity principle – general responsivity dictates that interventions should

be based on cognitive social learning principles, which have proven to be most efficacious in reducing criminal behaviour and enhancing positive community outcomes. Additionally, specific responsivity calls for interventions that consider specific personal, cognitive, and social factors that may facilitate or hinder an individual's treatment progress; such variables include an individual's "strengths, motivations, readiness to change, personality, mental status, learning ability, learning style, circumstances, and demographics" (Andrews et al., 2011, p. 738). Particularly relevant to the current discussion, RNR calls for CBT approaches to treatment which emphasize the need to address unique environmental influences, including ethnic and cultural factors (Dienes, Torres-Harding, Reinecke, Freeman, & Sauer, 2011).

As the above discussion has implied (and as the proponents of RNR have directly stated), criticisms of RNR indicating that the model fails to consider ethno-cultural issues represent a fundamental misunderstanding of the model in general, and of the responsivity principle in particular (Wormith, Gendreau, & Bonta, 2012). It would seem that an astute clinician practicing from an RNR framework would find that relevant characteristics related to ethnic and cultural background are handily accounted for within the (specific) responsivity principle. Indeed, in their response to critical evaluations of the model, both the developers as well as leading proponents of RNR have frequently noted that characteristics such as ethnicity and culture are well-situated within the context of the responsivity principle (e.g., Andrews, Bonta, & Wormith, 2011; Wormith et al., 2012). Most importantly, vast research evidence has almost unequivocally demonstrated that offender treatment programs which adhere to the three principles of the RNR model are associated with significant reductions in criminal recidivism, while programs that neglect these principles result in minimal recidivistic reductions or even increased recidivism rates (e.g., Andrews & Bonta, 2010; Andrews et al., 1990).

Overall, while the RNR model draws attention to the necessity of addressing ethnic and cultural factors within treatment, even the staunchest supporters of the model must acknowledge the evidence that treatment completion rates among ethnic minority offenders are lower than among White offenders. Therefore, it could be strongly argued that the majority of treatment programs and/or providers working from an RNR framework are not adequately accounting for critical ethno-cultural variables, despite this representing a necessary element in any rigorous application of the model. It is also noteworthy that, with the exception of Marshall and Barbaree's (1990) integrative theory, many of the theoretical accounts previously reviewed in

section 1.6 do not explicitly address the potential influence of cultural factors in the development and maintenance of sexually deviant behaviour (and by extension, possible culturally-related treatment targets). Ultimately then, further research is required to not only identify those unique ethnic and cultural factors that impact successful treatment completion, but also to determine how such variables can most appropriately be addressed within offender treatment programs.

Additional strengths, limitations, and avenues for future research applicable to the overall project are presented in chapter 5. Overall, the identification of several important differences between White and visible minority offenders, including those related to demographic, mental health, offence history, and treatment-related characteristics, highlights the pertinent need for ongoing research in this area.

Chapter 3. Study 2: Intellectual Functioning and Phallometric Assessment

3.1 Literature Review

3.1.1 Introduction

Estimates of the number of offenders characterized by some level of intellectual deficit vary widely, ranging from 2% to 40% (Tudway & Darmoody, 2005). Within Canadian prison populations, it is estimated that between 7% and 25% of federal inmates have some degree of intellectual impairment, which is at least twice as high as in the general population (Crawford, 2002). Researchers have noted several reasons for such disparate prevalence rates, such as different definitions of, and varying cut-off points for, intellectual impairment (Brown, Stein, & Turk, 1995; Day, 1993; Tudway & Darmoody, 2005). Regardless, the number of offenders with some degree of impairment clearly constitutes a considerable proportion of offenders, and CSC (2007) has recognized an increase in rates of offenders with learning disabilities and “low functioning capacities” (p. 13). Of particular note, lower IQ offenders appear to be overrepresented among the sex offender population (Day, 1993; Hawk, Rosenfeld, & Warrant, 1993), making this a pertinent area of study.

3.1.2 Definitional clarifications

The current study examined intellectual functioning as a continuous variable using correlation and regression analyses. In contrast, much of the research examining IQ scores and phallometric responding has distinguished between lower and higher IQ participants. Therefore, a brief note regarding terminology is warranted here, as the following literature review makes frequent reference to offenders characterized by some degree of intellectual impairment.

The DSM-5 (American Psychiatric Association, 2013) has outlined the essential features of intellectual disability (or intellectual developmental disorder) as deficits in general mental abilities and impairments in everyday adaptive functioning whose onset occurs during the developmental period (i.e., childhood or adolescence). It is noted that intellectual functioning is most commonly measured using comprehensive, psychometrically validated tests of intelligence, with intellectually disabled individuals scoring approximately two standard deviations or more below the population mean. For instruments with a mean of 100 and a standard deviation of 15, scores of 65 to 75 (70 ± 5) would be characteristic of individuals typically diagnosed with intellectual developmental disorder. In addition to significant deficits in intellectual functioning (Criterion A), a diagnosis of intellectual disability also requires evidence of concurrent deficits

across three domains of adaptive functioning (i.e., conceptual, social, and practical domains) that “result in failure to meet developmental and socio-cultural standards for personal independence and social responsibility” (Criterion B; American Psychiatric Association, 2013, p. 33). Finally, there must also be evidence that the onset of intellectual and adaptive deficits occurred during childhood or adolescence (Criterion C).

As noted above, researchers who have examined intellectual functioning among sex offender populations have often differentiated between low IQ and average or high IQ offenders; low IQ cut-off scores have typically ranged from 85 to 75 and below (Barbaree & Marshall, 1988; Borzecki, Bradford, Pawlak, Zohar, & Wormith, 1985, as cited in Wormith, 1986; Looman, 2000; Marshall, Barbaree, & Christophe, 1986; Murphy, Haynes, Coleman, & Flanagan, 1985; Rice, Harris, Lang, and Chaplin, 2008; Wormith, Bradford, Pawlak, Borzecki, & Zohar, 1988). Additionally, researchers have variously referred to low IQ offenders as mentally retarded (e.g., Day, 1994; Rice et al., 2008; Schoen & Hoover, 1990) developmentally disabled (e.g., Caparulo, 1991; Haavan & Schank, 2001), learning disabled (e.g., El-Leithy & Webb, 1998; Winter et al., 1997), or as those characterized by learning difficulties (e.g., O'Connor & Rose, 1999).

There are at least three reasons why the above terms were not suitable for the purpose of the current study. First, the noted inconsistencies in both terminology and designated cut-off scores for impairment have resulted in a lack of definitional clarity. Furthermore, as noted, the use of some of these terms requires the presence of additional diagnostic criteria that are often not formally established (e.g., concurrent deficits in adaptive functioning). Finally, such terms carry pejorative connotations (e.g., disabled or retarded) or represent misleading diagnostic labels. For example, the DSM-5 differentiates learning disorders as a distinct category of academically-related difficulties that do not necessarily include intellectual deficits. As such, it was decided to simply use the term low IQ offender to refer generally to individuals characterized by sub-average cognitive functioning that is in accordance with IQ scores equal to or less than 85.

3.1.3 IQ and phallometric responding

Despite the sizeable proportion of low IQ offenders, relatively little research has been conducted on the assessment of deviant sexual arousal within this population (O'Connor & Rose, 1999). Particularly, researchers have noted for several years that there is a lack of evidence for

the utility of phallometric assessment with low IQ offenders (Caparulo, 1991; Clare, 1993; El-Leithy & Webb, 1998; Haavan & Schlank, 2001; Schoen & Hoover, 1990).

Researchers examining the correlation between IQ and phallometric responding have consistently found that low IQ offenders demonstrate significantly stronger arousal to deviant phallometric stimuli relative to average IQ offenders (Barbaree & Marshall, 1988; Borzecki et al., 1985, as cited in Wormith, 1986; Looman, 2000; Marshall, Barbaree, & Christophe, 1986; Murphy, Haynes, Coleman, & Flanagan, 1985; Rice, Harris, Lang, and Chaplin, 2008; Wormith, Bradford, Pawlak, Borzecki, & Zohar, 1988). Furthermore, Marshall and colleagues (1986) found that, along with low IQ incest offenders, non-offender controls with IQ scores of 90 or less were also more likely than those with higher IQ scores to display deviant sexual interests at assessment.

3.1.4 Social desirability, PPG, and intellectual impairment

Several researchers have suggested that low IQ offenders may lack effective cognitive mechanisms for inhibiting penile arousal in comparison to non-impaired offenders (Marshall & Fernandez, 2003; Murphy & Barbaree, 1994; Wormith, 1986). Alternatively, Wormith (1986) also proposed that average and high IQ offenders may be more sensitive to the importance of responding in a prosocial manner during phallometric testing. More recently, Stinson and Becker (2008) noted that "[s]exual interests related to deviant, inappropriate, or abnormal stimuli may be minimized or denied in order to avoid stigma, labeling, or perceptions of risk or dangerousness" (p. 380). However, while average and high IQ offenders may be acutely aware of the potential repercussions associated with endorsing sexually deviant interests, low IQ offenders tend to display greater openness about their deviant thoughts and behaviours, particularly about sexual preferences for children (Holland et al., 2000). It has also been noted that these offenders are often socially naive and lack appropriate social skills (Day, 1994; Winter, Holland, & Collins, 1997).

The greater openness of low IQ offenders regarding their deviant sexual interests presumably extends to their approach to phallometric testing, where they may not appreciate the consequences of deviant responding and therefore not consider attempting to suppress their arousal. This is in stark contrast to large numbers of average and high IQ offenders, who, as noted in section 1.8.5, frequently report not attending to phallometric stimuli or using mental

imagery methods in order to suppress arousal (Flak, Beech, & Fisher, 2006; Freund, Watson, & Rienzo, 1988; Mahoney & Strassberg, 1991; Murphy & Barbaree, 1994).

As one may intuit from the findings reviewed thus far, offenders' willingness to fake their phallometric test results may largely reflect a socially desirable response bias. Paulhus (1999) differentiated between two forms of socially desirable responding: 1) self-deceptive enhancement, referring to the tendency to provide honest but inflated self-descriptions, and, 2) impression management, referring to the tendency to present oneself in an overly positive light to an audience. In the context of phallometric assessment, socially desirable responding would generally take the form of offenders actively attempting to suppress their penile arousal to deviant stimuli in order to present themselves more favourably (i.e., impression management). Indeed, research has found that low responding to phallometric stimuli among sex offenders is correlated with elevated scores on scales designed to measure social desirability. Specifically, Looman, Abracen, Maillet, and DiFazio (1998) demonstrated that low PPG responders scored significantly higher on the Crown-Marlowe Social Desirability Scale (CMSD) and the Impression Management subscale of the Balanced Inventory of Desirable Responding (BIDR), both of which measure an individual's tendency to give inflated positive self-descriptions.³

As noted above, given that low IQ offenders are more socially naive than other offenders, they may be less likely to attempt to suppress their deviant arousal, as they cannot fully appreciate the serious implications such responding may entail. It is also possible that these offenders may lack the cognitive capacity required to employ mental strategies aimed at reducing arousal. Thus, because low IQ offenders may actually provide a more accurate response profile, they may also be unfairly regarded as more deviant and more likely to reoffend in comparison to average and high IQ offenders, who may be more willing and capable of suppressing or reducing their deviant arousal.

It is particularly noteworthy that Rice and colleagues (2008) found that despite exhibiting stronger arousal to deviant phallometric stimuli, low IQ offenders were in fact significantly less likely to sexually re-offend relative to a comparison group (19% versus 45%, respectively). Such a finding suggests that phallometric assessment may indeed be an inappropriate measure of

³ With the publication of the seventh edition of the BIDR, the name of the revised measure was changed to the Paulhus Deception Scales (PDS; Paulhus, 1999). The measure will be referred to as the PDS throughout the remainder of this document, as the seventh version was utilized for the purpose of the current study.

deviant sexual arousal among low IQ offenders, at least as their results are used to infer recidivism risk relative to non-impaired offenders.

3.2 Purpose and Hypotheses for Study 2

The primary purpose of the current study was to examine the potential impact of intellectual functioning on socially desirable responding and subsequent phallometric test results. The first objective was to determine if IQ was correlated with socially desirable responding. Given that lower IQ offenders tend to display greater openness about their deviant thoughts and behaviours, it was hypothesized that IQ would be significantly positively correlated with scores on a measure of social desirability (i.e., the PDS). Specifically, it was posited that decreasing IQ scores would be associated with decreasing scores on the Impression Management subscale of the PDS.

Second, it was hypothesized that IQ would be significantly negatively correlated with deviant phallometric responding (i.e., PPG responding would increase as IQ scores decreased); the purpose here was an attempt to replicate the results of previous research, which has found that lower IQ offenders tend to demonstrate stronger arousal to deviant phallometric stimuli relative to average IQ offenders (Barbaree & Marshall, 1988; Borzecki et al., 1985, as cited in Wormith, 1986; Looman, 2000; Marshall et al., 1986; Murphy et al., 1985; Rice et al., 2008; Wormith et al., 1988). Third, in line with the findings of Looman and colleagues (1998), it was hypothesized that deviant PPG responding would be negatively correlated with scores on the Impression Management (IM) subscale of the PDS.

Finally, as an extension of the above research, it was hypothesized that the negative relationship between IQ and deviant phallometric responding would be eliminated when controlling for PDS IM scores. Taken together, such findings would indicate that a lack of socially desirable responding among lower IQ offenders is responsible for their greater deviant PPG responding relative to average and high IQ offenders. Overall then, the findings of the current study would help to elucidate the importance of taking into account offenders' intellectual functioning capacity and level of socially desirable responding when conducting phallometric assessments.

3.3 Methodology

3.3.1 Participants

The participants for the current study were derived from the overall sample of RTC sex offenders as outlined in section 2.3.3.1, and included 79 participants. In addition to child molesters and mixed offenders (as defined in section 2.3.1), the current sample also included rapists (i.e., individuals who had committed contact sex offences with adult victims only). Regarding their sexual offence history, the sample was comprised primarily of rapists (55.7%, $n = 44$), followed by child molesters (41.8%, $n = 33$) and mixed offenders (2.5%, $n = 2$). Regarding assessments of intellectual functioning, the majority of the participants had been administered the WAIS-R (58.2%, $n = 46$), followed by the KBIT-2 (26.6%, $n = 21$) and WAIS-III (15.2%, $n = 12$). The mean IQ of the overall sample was 88.1 ($SD = 13.0$). Offenders classified as being in the low IQ group (i.e., $IQ \leq 85$; $n = 40$) had a mean IQ of 77.9 ($SD = 5.8$), while the average IQ group (i.e., $IQ > 85$; $n = 39$) had a mean IQ of 98.5 ($SD = 9.5$). Additional sample characteristics are provided in the results section.

3.3.2 Measures

3.3.2.1 PPG

As part of a standard assessment battery, all of the offenders in the current study participated in a phallometric assessment, as delineated in section 2.3.2.1.

3.3.2.1.1 Stimuli. The child sexual violence assessment was comprised of 22 audiotaped vignettes as described in section 2.3.2.1.2 (Quinsey & Chaplin, 1988). The adult sexual violence assessment was comprised of 14 audiotaped stimuli (Quinsey, Chaplin, & Varney, 1981). Four of the vignettes depicted consensual sexual activity between an adult male and female (two in which the woman initiates sexual contact, and two in which the male is the initiator). Four of the vignettes depicted rape scenarios, two of which where there was a sexual motivation, and two of which where there was an anger motivation. Two of the vignettes depicted nonsexual physical assaults with an anger motivation, while an additional two vignettes depicted nonsexual physical assaults with a robbery motivation. Finally, two neutral vignettes depicted nonsexual, nonviolent interactions between a male and female (e.g., a job interview; Looman & Marshall, 2005).

3.3.2.2 PDS

The PDS is a 40-item self-report questionnaire that measures one's tendency to provide socially desirable responses (Paulhus, 1999). Respondents rate each item on a five-point Likert-

type scale, indicating the degree to which each statement applies to them. The instrument is comprised of two subscales, Self-Deceptive Enhancement (SDE) and Impression Management (IM). Self-deceptive enhancement reflects the tendency to give honest but exaggerated self-descriptions, with high scorers demonstrating a form of “rigid overconfidence akin to narcissism” (Paulhus, 1999, p. 9). Impression management, in contrast, represents behaviour commonly referred to as lying or faking. Individuals who score highly on the IM subscale frequently endorse desirable, but uncommon, behaviours (e.g., “I never swear”). Such response patterns generally indicate that the respondent is most likely intentionally exaggerating or distorting their answers in an attempt to impress their perceived audience.

Paulhus (1999) provided reliability and validity data for the PDS in the test manual. Cronbach’s alpha coefficients ranged from .83 to .86 across a variety of participant samples (e.g., general population, college students, military recruits), indicating a high degree of internal consistency. In an examination of an inmate population, Paulhus (1999) reported reliability coefficients of .72 (SDE scale), .84 (IM scale), and .86 (overall measure). The PDS has also been shown to correlate with other popular measures of social desirability, including the Marlow-Crowne Social Desirability Scale ($r = .73$) and the Edwards Social Desirability Scale ($r = .64$). Finally, Paulhus (1999) noted that the SDE and IM scales tend to demonstrate low intercorrelations with one another (i.e., $r = .20-.32$), pointing to the discriminative validity of the measure while also highlighting the theoretical and empirical justification for differentiating between the two types of socially desirable responding. Kroner and Weekes (1996) investigated the validity of the PDS with a large sample of federal inmates (primarily sexual and violent offenders), and determined that the measure held utility for the assessment of socially desirable responding among this population. Several subsequent studies have also utilized the PDS for the assessment of socially desirable responding among offender populations (Mills & Kroner, 2005; Mills & Kroner, 2006; Mills, Loza, & Kroner, 2003; Nugent & Kroner, 1996).

Consistent with Looman and colleagues (1998), only the IM subscale of the PDS was included for the purposes of the current study, as the investigation focused explicitly on offenders’ intentional attempts at lying or faking and the possible relationship of such impression management with IQ and phallometric responding. In contrast, self-deceptive enhancement (as measured by the SDE subscale) reflects an unconscious level of processing in which overly positive self-descriptions are simply believed to be true by the individual. As Paulhus (2002)

noted, controlling for self-deceptive enhancement is likely not useful in increasing the validity of assessments. No hypotheses regarding offenders' level of self-deceptive enhancement were therefore put forth for the current study, and as such the SDE subscale of the PDS was not included for analysis.

3.3.2.3 IQ testing

All of the offenders in the current sample were administered one of the following standardized measures of intelligence: the Kaufman Brief Intelligence Test, Second Edition (KBIT-2; Kaufman & Kaufman, 2004); the Wechsler Adult Intelligence Scale – Revised (WAIS-R; Wechsler, 1981); or the Wechsler Adult Intelligence Scale, Third Edition (WAIS-III; Wechsler, 1997).

3.3.2.3.1 KBIT-2. The KBIT-2 was designed as a screening measure of verbal and non-verbal intellectual abilities in individuals ranging in age from 4 years to 90 years 11 months (Kaufman & Kaufman, 2004). The measure takes approximately 15 to 30 minutes to administer, and the authors suggested that its use is appropriate in situations that do not require a comprehensive assessment of intellectual functioning, including various forensic screening purposes.

The KBIT-2 is based on the Cattell-Horn-Carroll (CHC) model of assessment, which conceptualizes intelligence as a broad construct comprised of narrower abilities (Carroll, 1997). Accordingly, the KBIT-2 contains three subtests that measure various facets of intelligence as conceptualized in the CHC model. Specifically, the Verbal Knowledge and Riddles subtests are designed to measure the broad ability of Crystallized Ability (*Gc*), while the Matrices subtest is designed to measure the broad abilities of Fluid Reasoning (*Gf*) and Visual Processing (*Gv*; Kaufman & Kaufman, 2004). The Verbal Knowledge and Riddles subtest scores are combined and used to derive a Verbal Score, while the Matrices subtest score is used to derive a Nonverbal Score. The Verbal and Nonverbal Standard Scores are combined and converted into an IQ Composite score, which is intended to reflect overall intelligence as conceptualized by the authors.

Kaufman and Kaufman (2004) provided reliability and validity data for the KBIT-2 in the test manual; they reported acceptable levels of internal consistency (split-half reliability coefficients ranging from .78 to .93 across age groups and composite scores), and test-retest reliability (.76-.93). The authors' investigation of concurrent validity also demonstrated that

KBIT-2 Composite scores correlated highly with other popular measures of intelligence, including with WAIS-III FSIQ scores (.89), Wechsler Abbreviated Scale of Intelligence (WASI) FSIQ scores (.77-.88), and Wechsler Intelligence Scales for Children, Fourth Edition (WISC-IV) FSIQ scores (.77; Kaufman & Kaufman, 2004).

3.3.2.3.2 *WAIS-R/WAIS-III*. The WAIS, in its various iterations, is one of the most widely used psychological measures of cognitive functioning (Camara, Nathan, & Puente, 2000; Rabin, Barr, & Burton, 2005), and it has long been considered the “gold standard” for the assessment of intelligence (Ivnik et al., 1992). The WAIS is designed to assess an individual’s overall level of intellectual functioning and to provide information regarding the possible presence or absence of cognitive impairment or disability (Lezak, Howieson, & Loring, 2004).

The WAIS-R (Wechsler, 1981) is a revision of the WAIS instrument that was published in 1955 (the first version of the test was named the Wechsler-Bellevue Intelligence Scale and was originally published in 1939). The instrument was designed to measure intellectual functioning in adults ranging in age from 16 years to 74 years 11 months, taking approximately 60 to 90 minutes to administer. The WAIS-R is comprised of six verbal subtests (Information, Comprehension, Arithmetic, Digit Span, Similarities, Vocabulary) and five performance subtests (Picture Arrangement, Picture Completion, Block Design, Object Assembly, Digit Symbol). The measure provides a Verbal IQ (VIQ) score, Performance IQ (PIQ) score, and an overall Full Scale IQ (FSIQ) score. Wechsler (1981) provided reliability data for the WAIS-R in the test manual. The measure demonstrated high levels of internal consistency (split-half reliability coefficients ranging from .93 to .97 across the composite scores) and test-retest reliability (.95-.96 for FSIQ scores). While no validity data was provided in the manual, the original WAIS demonstrated moderate correlations with academic achievement ($r = .50$) and years of education ($r = .70$). Subsequent research has demonstrated significant relationships between WAIS-R FSIQ scores and scores on other measures of intellectual functioning, including the Wide Range Achievement Test (WRAT; Ryan & Rosenberg, 1983) and the KBIT (Naugle, Chelune, & Tucker, 1993).

The WAIS-III (Wechsler, 1997) is a revision of the WAIS-R, and changes to the instrument were reflective of then-contemporary theory and research in the area of intelligence testing. The measure was expanded to assess additional facets of cognitive functioning (i.e., working memory and processing speed), and the age range was expanded to include individuals

up to 89 years old. Along with the original VIQ, PIQ, and FSIQ scales, the WAIS-III also includes a Perceptual Organization Index (POI), Working Memory Index (WMI), and Processing Speed Index (PSI).

The technical manual for the WAIS-III indicated a high degree of internal consistency (split-half reliability coefficients ranging from .88 to .97 across composite scores) and test-retest reliability (.95-.97 for FSIQ scores). The WAIS-III also correlated strongly with other measures of intelligence, including the WAIS-R, the Standard Progressive Matrices, the Stanford-Binet IV (The Psychological Corporation, 1997), the General Ability Measure for Adults (GAMA; Martin, Donders, & Thompson, 2000), and the WASI (Axelrod, 2002), with correlations ranging from .60 to .92.

3.3.3 Procedure

3.3.3.1 Data collection and PPG testing procedure

Readers are referred to sections 2.3.3.1 and 2.3.3.3 for a description of data collection and PPG testing procedures. Note that only auditory stimuli were utilized for the purposes of the current study, and as such the description of visual stimuli presentation provided in section 2.3.3.3 was not applicable here.

3.3.3.2 Data preparation

Data preparation was consistent with the description provided in section 2.3.3.3, including the rationale for using the percent of full erection (PFE) ratio and differential variables, as well as for the participant inclusion criteria based on phallometric responding. The process for calculating the ratio and differential scores for the auditory rape stimuli was similar to that described in section 2.3.3.3.1 regarding the auditory child molester stimuli. Specifically, the calculations for the ratio and difference scores utilized within-participant mean PFE responding to the four appropriate stimuli (i.e., those depicting consensual sex with an adult female) and mean responding to the four deviant stimuli (i.e., rape scenarios), resulting in one ratio score and one differential score.

As with Study 1, overall hybrid auditory PPG variables were calculated by collapsing all offender types together; this process was slightly modified given that the current study also included rapists. Specifically, the choice of what data point to include in the hybrid variables was based on offender classification and the strongest level of deviant responding demonstrated within the relevant stimuli type. Thus, for child molesters the hybrid variables utilized each

participant's strongest responding to any of the child stimuli (i.e., male/female, passive/coercive/sexually violent depiction), while there was only a single variable to be used for rapists (presented as either a ratio or difference score). For mixed offenders, their highest level of deviant responding to either the rape stimuli or to any of the child stimuli was used in the overall hybrid variables.

Additionally, as discussed further in section 3.4.2, the initial hypothesis-related results of the correlational and regression analyses led this author to consider the possibility that the transformation of phallometric PFE responding into ratio and difference scores may have controlled for the magnitude of participants' deviant responding, thus possibly eliminating potential differences in responding that may have existed as a function of IQ and/or IM scores. As such, the analyses were re-run using untransformed PFE response variables (both deviant and appropriate responding). The untransformed deviant PFE response variable was calculated by taking the overall average of participants' PFE responding to all relevant deviant stimuli (i.e., either rape or child stimuli), while the appropriate PFE response variable represented average PFE responding to all corresponding appropriate stimuli. As with the PFE ratio and difference scores, the untransformed PFE variables represented hybridized variables. Specifically, the hybrid variables utilized average PFE responding to the adult sexual violence stimuli for rapists, while average PFE responding to the child sexual violence stimuli was used for child molesters. For mixed offenders, their highest level of responding to either the adult sexual violence or child sexual violence stimuli sets was chosen for inclusion.

Finally, a hybrid IQ variable was also created for the purpose of the current study, as participants had either been administered the KBIT-2, WAIS-R, or WAIS-III. Therefore, the hybrid IQ variable represented participants' IQ score on the particular measure that each had completed. While each of the three tests contains subscale measures of verbal and nonverbal intelligence that comprise their respective full scale IQ scores, it was decided to not examine these subscales individually based on several factors. First, while the necessity of creating a hybrid IQ score already represented a limitation of the study, using participants' full scale IQ scores was reasonably justified given that such scores represent the most reliable estimate of intellectual functioning by tapping the broadest array of cognitive abilities; this is particularly salient given that the KBIT-2 is only a screening measure of intelligence (indeed, the Matrices subtest is the only measure of nonverbal functioning). In contrast, the correlations between

individual verbal and nonverbal subscales across IQ measures, and specifically for the KBIT and WAIS instruments, are lower than that for the full scale IQ scores (Naugle et al., 1993). For example, while KBIT-2 and WASI full scale IQ scores are highly correlated (i.e., $r = .88$), the correlation between the nonverbal subscales is substantially lower (i.e., $r = .62$; Kaufman & Kaufman, 2004). Similarly, while there are no direct comparisons of the KBIT-2 and the WAIS-R (the two measures which comprised the majority of IQ testing in the current sample), it has been noted that the original KBIT had a significant verbal-nonverbal overlap between its two scales, resulting in small to moderate correlations with commensurate scales of the WAIS-R (i.e., $r = .23-.59$; Naugle et al., 1993). Taken together, these issues suggest that hybridized verbal and nonverbal variables may be substantially less reliable estimates of participants' functioning in contrast to the hybrid full scale IQ score, and which therefore may result in somewhat spurious findings. Furthermore, the choice to focus solely on full scale IQ scores is consistent with previous research (i.e., Barbaree & Marshall, 1988; Barbaree et al., 1986; Looman, 2000; Murphy et al., 1985; Rice et al., 2008; Wormith et al., 1988). Finally, no specific hypotheses were put forth regarding potential differences related to verbal and nonverbal capacities in the context of the current investigation, and as such only full scale IQ scores were examined.

3.3.3.3 Analyses

Rather than rely on somewhat artificial distinctions between lower and higher IQ participants, it was decided to examine IQ as a continuous variable using correlation and regression analyses. However, initial exploratory analyses (i.e., chi-square and independent samples t-tests) were conducted in order to elucidate potential differences between lower and higher IQ offenders on a variety of socio-demographic, mental health, offence, and treatment-related characteristics. For these initial analyses, an IQ score of 85 or less was used as the cut-off point for the low IQ group. The decision to use a cut-off score of 85 was based on several factors. First, the means and standard deviations of the KBIT-2, WAIS-R, and WAIS-III all have a mean of 100 and a standard deviation of 15. Additionally, the choice to use an IQ cut-off score of 85 is consistent with previous research, which has typically used cut-off scores of 75 to 85 (as noted in section 3.1.2). While cut-off scores of 80 or less were considered, the small number of offenders from the current sample with IQ scores of less than 80 precluded the use of such a stringent cut-off. Hence, it was necessary to use a cut-off score of 85 in order capture some degree of intellectual impairment while still maintaining adequate samples sizes in both the low

and high IQ groups. As noted, the use of such a cut-off was only for the purposes of initial exploratory analyses, and was not relevant to the subsequent hypothesis-driven analyses.

Following the choice of IQ cut-off score, a one-way ANOVA was conducted in order to determine if there were significant differences in IQ scores based on offender type (i.e., rapists, child molesters, or mixed offenders). The subsequent correlational analyses incorporated a variety of relevant variables (i.e., offence history, level of denial regarding offence, number of previous sex offender treatment programs completed, and number of prior PPG assessments) in order to determine their potential associations with phallometric responding; this also included those variables that were directly related to the first three hypotheses of the current study (i.e., IQ and PDS IM scores). Following from this, hierarchical regression analyses were conducted in order to determine the predictive accuracy of the various independent variables. Initial regression analyses utilized IQ and PDS IM scores in order to directly test the fourth hypothesis of the current study; IM scores were added in the first step of the regression, while IQ scores were added in the second step. Subsequent regression analyses incorporated those variables that had been found to be significantly associated with phallometric responding in the initial correlation analyses. Any variables that were found to be significantly correlated with phallometric responding were added in the first step of these regression analyses, followed by IM scores in the second step, and IQ scores in the final step; given that these additional variables were not chosen on an a priori basis, they are identified in the results section.

3.4 Results

3.4.1 Descriptive results

As can be seen in Table 3.1, low and average IQ offenders differed in several respects. Perhaps as would be expected, low IQ offenders were significantly less likely to have completed high school. Low IQ offenders also had a significantly greater number of previous psychiatric admissions, were more likely to be diagnosed with pedophilia, and were significantly younger both at the time of their first arrest and at the time of the current assessment. The results of the one-way ANOVA indicated that there was no significant difference in IQ scores between rapists, child molesters, and mixed offenders, $F(3, 76) = 2.34, p = .103$.

As shown in Table 3.2, the results of the Pearson's correlations indicated that the PFE ratio and differential scores were significantly and strongly correlated with one another. However, the only other variables that were correlated with either of the PPG measures were

Table 3.1
Study 2 Sample Characteristics

Variable	Overall		Avg. IQ (> 85)		Low IQ (≤ 85)		<i>t</i> or χ^2
	<i>n</i>	<i>M</i> (<i>SD</i>) or %	<i>n</i>	<i>M</i> (<i>SD</i>) or %	<i>n</i>	<i>M</i> (<i>SD</i>) or %	
<u><i>Socio-demographics</i></u>							
Completed at least grade 12	64	18.8	32	34.4	32	3.1	10.26***
Ever married	70	55.7	35	57.1	35	54.3	.06
History of drug abuse	72	61.1	37	62.2	35	60.0	.04
History of alcohol abuse	71	74.6	37	75.7	34	73.5	.04
Sexually abused as child	71	60.6	36	52.8	35	68.6	1.85
Physically abused as child	63	65.1	32	56.3	31	74.2	2.23
Witnessed sexual abuse as child	45	17.8	26	11.5	19	26.3	1.64 [†]
Witnessed physical abuse as child	50	54.0	27	44.4	23	65.2	2.16
Age at first exposure to sex	53	13.3 (3.1)	27	13.6 (2.8)	26	12.5 (4.1)	-.73
<u><i>Mental Health</i></u>							
No. prior psychiatric admissions	60	1.8 (2.1)	29	1.1 (1.6)	31	2.4 (2.3)	2.62*
Previous psychiatric treatment	69	42.0	34	32.4	35	51.4	2.58
Diagnosed personality disorder	67	59.7	33	57.6	34	61.8	.12
Diagnosed psychosis	67	11.9	33	9.1	34	14.7	.50 [†]
Diagnosed mood disorder	67	6.0	33	6.1	34	5.9	.00 [†]
Diagnosed substance abuse disorder	67	6.0	33	6.1	34	5.9	.00 [†]
Diagnosed paraphilia	67	20.9	33	6.1	34	32.4	5.48*
<u><i>Cognitive Functioning</i></u>							
Previous ADHD diagnosis	21	19.0	12	16.7	9	22.2	.10 [†]
History of head injury	21	19.0	12	16.7	9	22.2	.10 [†]
<u><i>Criminal History</i></u>							
Age at first arrest	77	18.9 (6.8)	39	20.8 (8.5)	39	17.1 (3.9)	-2.45*
No. federal incarcerations	77	1.8 (.9)	38	1.8 (1.0)	39	1.7 (.9)	-.61
No. sexual convictions	77	4.0 (4.5)	38	4.5 (4.9)	39	3.6 (4.1)	-.81
No. violent convictions	77	6.6 (5.6)	38	7.6 (6.6)	39	5.6 (4.3)	-1.49
No. nonviolent convictions	77	16.6 (20.6)	38	20.1 (26.4)	39	13.2 (12.1)	-1.51
<u><i>Current Offence-related</i></u>							
Age at offence	72	29.5 (7.6)	36	30.8 (7.4)	36	28.1 (7.7)	-1.39
Length of sentence (years)	51	7.0 (6.0)	26	6.7 (4.4)	25	7.3 (7.4)	.40
Drugs/alcohol related to offence	68	61.8	33	66.7	35	57.1	.65
<u><i>Offender Classification</i></u>							
Rapist	79	55.7	39	46.2	40	65.0	2.84
Child molester	79	41.8	39	48.7	40	35.0	1.53
Mixed	79	2.5	39	5.1	40	.0	2.12 [†]
<u><i>Treatment-related</i></u>							
Age at assessment	77	39.7 (8.5)	38	41.9 (8.7)	39	37.5 (7.8)	-2.23*
No. prior PPG assessments	52	1.5 (1.4)	27	1.3 (1.5)	25	1.8 (1.4)	1.13
Admits to deviant fantasies	62	58.1	29	51.7	33	63.6	.90
No. prior SO programs completed	55	1.0 (1.2)	27	.7 (1.1)	28	1.3 (1.2)	1.86
Post-PPG txt completion	53	75.5	29	82.8	24	66.7	1.84

* Significant IQ group difference at the $p \leq .05$ level. ** $p \leq .01$. *** $p \leq .001$.

[†] Chi-square contained at least one cell with expected count < 5.

Table 3.2

Means, Standard Deviations, and Intercorrelations for PPG Outcome Measures and Potential Predictor Variables

Variable	<i>M (SD)</i>	1	2	3	4	5	6	7	8	9	10
1. PPG ratio score <i>n</i>	1.8 (1.8) 79	-									
2. PPG difference score <i>n</i>	-.5 (30.2) 79	.60***	-								
3. IQ <i>n</i>	88.1 (13.0) 79	-.07 79	-.08 79	-							
4. PDS IM score <i>n</i>	52.2 (11.9) 70	-.20 70	-.08 68	.07 70	-						
5. No. sexual convictions <i>n</i>	4.0 (4.5) 77	.36** 77	.28* 75	.12 77	.01 70	-					
6. No. violent convictions <i>n</i>	6.6 (5.6) 77	.14 77	.02 75	.16 77	.01 70	.69*** 77	-				
7. No. nonviolent convictions <i>n</i>	16.6 (20.6) 77	-.16 77	-.16 75	.18 77	-.03 70	-.25* 77	.07 77	-			
8. Level of offence denial <i>n</i>	- 65	-.01 65	.03 63	.10 65	-.07 62	-.02 65	-.09 65	-.08 65	-		
9. No. prior SO txt programs <i>n</i>	1.0 (1.2) 55	.14 55	.38** 53	.03 55	-.16 48	.32* 55	.14 55	-.31* 55	.41** 47	-	
10. No. prior PPG Ax. <i>n</i>	1.5 (1.4) 52	.04 52	.08 50	.05 52	-.18 45	.10 52	-.02 52	-.26 52	.39** 44	.64*** 52	-

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

participants' sexual offence history (i.e., number of sex offence convictions) and the number of times that participants had previously participated in sex offender treatment programming. As such, these two variables were chosen for inclusion in the subsequent regression analyses along with IQ and PDS IM scores (as these latter variables represented the focus of the current study).

3.4.2 Hypothesis testing

As shown in Table 3.2, IQ was not significantly correlated with PDS IM scores, nor was it correlated with either ratio or differential PPG responding. Similarly, it can be seen that IM scores were also not significantly correlated with either PPG response variable.⁴ Although neither IQ nor IM was significantly correlated with phallometric responding, regression analyses were conducted in order to confirm the results of the correlational analyses, and to determine if IM scores were potentially suppressing an underlying relationship between IQ and phallometric responding. The results of these regression analyses indicated that IQ was not a significant predictor of PFE ratio scores, $F(1, 77) = .417, p = .520, \text{adj. } R^2 = -.008$, or of PFE differential scores, $F(1, 77) = .520, p = .475, \text{adj. } R^2 = -.007$; these results were expected given the initial non-significant correlations. Additionally, as shown in Table 3.3, PDS IM subscale scores were also not a significant predictor of PPG ratio or differential scores; again, this was expected given that IM scores were not significantly correlated with phallometric responding. Furthermore, the overall regression models were also not significant.

In order to further confirm the lack of relationship between IQ scores and phallometric responding, additional regression analyses were conducted utilizing those variables that were identified as being significantly correlated with phallometric responding. Given that sexual offence history and the number of previous sex offender treatment programs were significantly correlated with one or both of the PPG response outcome variables, these variables were included in the subsequent regression analyses. Additionally, independent samples t-tests indicated that there was a statistically significant difference in phallometric responding between rapists and child molesters for both PFE ratio scores, $t(77) = -4.804, p < .0001$, and PFE

⁴ While PDS SDE scores and hybrid verbal and nonverbal IQ subscale scores were not included in the formal data analysis plan (as delineated in sections 3.3.2.2 and 3.3.3.2, respectively), informal exploratory analyses indicated that none of these variables were significantly correlated with any of the phallometric outcome variables, nor were SDE scores significantly correlated with IQ. As such, these analyses are not included here.

Table 3.3

Hierarchical Regression Analysis Summary for IQ and PDS IM Scores Predicting Phallometric Responding

Ratio score predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.04 (.03)	
PDS IM	-.03	.02	-.19		
Step 2:				.05 (.02)	.01
IQ	-.01	.02	-.10		
Diff. score predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.01 (-.01)	
PDS IM	-.20	.32	-.08		
Step 2:				.02 (-.01)	.01
IQ	-.27	.30	-.11		

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

difference scores, $t(77) = -4.820, p < .0001$, with child molesters demonstrating significantly greater deviant arousal.⁵ As such, offender type was also included in the regression analyses.

As shown in Table 3.4, offender type, number of sexual convictions, and number of previous treatment programs were added to the regression models in step 1, followed by the addition of IM scores in step 2, and finally IQ scores in step 3. For both models, offender type was a significant predictor in step 1, while sex offence history was not a significant predictor; previous treatment history was a significant predictor of PFE difference scores, but did not significantly predict ratio scores. Both the PFE ratio score and difference score regression models were significant at all steps of analysis, accounting for 43% and 42% of the variability in PPG responding at step 3, respectively. The addition of PDS IM scores and IQ scores both resulted in non-significant changes to the overall R^2 values in each model.

As alluded to in section 3.3.3.2, the lack of any significant relationship between either IQ or IM scores and deviant phallometric responding highlighted the possibility that the use of PFE ratio and differential scores may have eliminated potential differences in PPG responding that could have been due to IQ and/or IM scores. Specifically, the nature of such transformations, while allowing for more accurate comparisons between offenders, may have essentially controlled for any possible effects that could be due to cognitive functioning or level of socially desirable responding. Therefore, as noted previously, several of the above analyses were re-run using untransformed PFE response variables (the process for creating these variables was described in section 3.3.3.2). The results of the Pearson's correlations indicated that PDS IM scores were significantly negatively correlated with PFE responding to deviant stimuli, $r = -.35, p = .005$, but not with responding to appropriate stimuli, $r = -.17, p = .167$. IQ scores were not significantly correlated with either deviant PFE responding, $r = -.066, p = .581$, or appropriate PFE responding, $r = .027, p = .824$. As shown in Table 3.5, neither the resulting overall regression model nor any of its component variables significantly predicted PFE phallometric responding. However, while not significant predictors of phallometric responding, the initial correlation analyses indicated that the relationship between PFE scores and IQ/IM were in the expected (i.e., negative) direction. Furthermore, it is noteworthy that, while again not significant,

⁵ Mixed offenders were combined with child molesters for these analyses, as they demonstrated stronger arousal to the child stimuli relative to the rape stimuli.

Table 3.4
Hierarchical Regression Analysis Summary for Five Offender Variables Predicting Phallometric Responding

Ratio score predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.39 (.35)***	
Offender type	2.08	.57	.49***		
No. sex convictions	.11	.06	.25		
No. previous SO treatment programs	-.14	.22	-.01		
Step 2:				.39 (.34)***	.00
PDS IM	.00	.03	.01		
Step 3:				.43 (.36)***	.04
IQ	-.03	.02	-.19		
Diff. score predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.38 (.34)***	
Offender type	27.53	8.20	.47**		
No. sex convictions	.17	.85	.03		
No. previous SO treatment programs	7.35	3.38	.28*		
Step 2:				.40 (.34)***	.02
PDS IM	.36	.35	.14		
Step 3:				.42 (.35)***	.02
IQ	-.34	.26	-.16		

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Table 3.5
Hierarchical Regression Analysis Summary for Five Offender Variables Predicting Mean Deviant PFE Responding

Deviant PFE predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.13 (.06)	
Offender type	8.90	4.78	.32		
No. sex convictions	-.09	.49	-.03		
No. previous SO treatment programs	1.51	2.06	.12		
Step 2:				.18 (.09)	.05
PDS IM	-.31	.20	-.26		
Step 3:				.20 (.09)	.02
IQ	-.16	.15	-.16		

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

the change in R^2 accounted for by PDS IM scores in the final regression analysis was the largest change among any of the regression analyses that were conducted.

3.5 Discussion

3.5.1 Group demographic differences

The initial chi-square analyses and independent samples t-tests highlighted some interesting differences between low and average IQ offenders. Most notably, low IQ offenders were significantly more likely to have been diagnosed with pedophilia; this finding raises two possibilities. First, it may be that there were truly a greater proportion of pedophilic individuals among the low IQ offender group relative to the average IQ group. As noted in section 1.6.1.1 for example, some researchers have suggested a possible etiological link between intellectual disability and pedophilic sexual interests (Day, 1994; O'Callaghan, 1998).

Alternatively, following from previous research which has indicated that intellectually disabled sex offenders demonstrate greater openness regarding their sexual interest in children (Holland et al., 2000), it is possible that low IQ offenders from the current sample were similarly more open to discussing their deviant sexual interests relative to average or high IQ offenders. As a result of such openness, the low IQ offenders may have been more likely to be diagnosed with pedophilia relative to the higher functioning offenders, even if this higher rate of diagnosis did not reflect a true group difference. This possibility is particularly interesting given that, while the difference was not statistically significant, child molesters made up a larger proportion of the average IQ offender group than the low IQ group (48.7% and 35.0%, respectively). However, the lack of a significant correlation between IQ and PDS IM scores in the current sample does cast some doubt on this latter possibility, given that the PDS is a measure of social desirability. In any case, while it is acknowledged that the cut-off score for designating offenders into the low IQ group in the current study was above that required for a diagnosis of intellectual disability, the fact that approximately half of the sample was comprised of low IQ offenders is consistent with previous research indicating that individuals characterized by intellectual impairment tend to be overrepresented among sex offender populations (Day, 1993; Hawk et al., 1993).

3.5.2 Postdictive validity of PPG

Before turning to a discussion of the hypotheses of the current study, it is noteworthy that offenders' sexual offence and treatment history were both found to be significantly correlated with deviant phallometric responding in the current study. Furthermore, treatment history was

found to be a significant predictor of phallometric difference scores in the subsequent regression analyses. While sex offence history was not found to be a significant predictor of either PFE ratio or differential scores in the subsequent regression analyses, this was likely due to the inclusion of offender type in step 1, which accounted for a particularly large amount of the variance. Indeed, sex offence history was a significant predictor of phallometric ratio scores when offender type was not included in the regression model (see Appendix E). As previously discussed in section 1.8.6.6, studies have frequently employed postdiction analyses in order to establish the concurrent validity of penile plethysmography, with several researchers having demonstrated correlations between historical offence-related characteristics and deviant phallometric responding (Abel, Barlow, Blanchard, & Guild, 1977; Abel et al., 1978; Avery-Clark & Laws, 1984; Barbaree & Marshall, 1989; Card & Dibble, 1995; Firestone, Bradford, Greenberg, Larose, & Curry, 1998; Malcolm, Andrews, & Quinsey, 1993). Thus, the results of the current study were consistent with the findings of previous research and provided further support for the concurrent validity of phallometric assessment.

3.5.3 Phallometric responding, IQ, and PDS scores

The majority of the hypotheses for the current study were not supported, or were only partially supported. Specifically, there was no correlation between IQ and PDS IM scores, although the non-significant relationship was in the positive direction as expected. Second, there was no correlation between IQ scores and any of the phallometric outcome variables (i.e., ratio scores, differential scores, mean deviant PFE responding, or mean appropriate PFE responding), although the non-significant relationships were in the expected negative direction. Third, PDS IM scores were not significantly correlated with either the ratio or differential PPG variables; as with hypotheses 1 and 2, the non-significant relationships were in the expected (negative) direction. However, IM scores were significantly negatively correlated with mean deviant PFE responding, providing some support for the third hypothesis; this finding is further discussed below. Finally, given the initial non-significant correlations between IQ and deviant phallometric responding, the final hypothesis (i.e., that the negative relationship between IQ and deviant phallometric responding would be eliminated when controlling for PDS IM scores) was superfluous.

It is noteworthy that PDS IM scores were significantly negatively correlated with mean deviant PFE responding, but not with the PFE ratio or differential scores. In essence, these

findings would suggest that the use of ratio and difference scores accomplishes the very task that such transformations are intended to address. Specifically, the ratio and difference scores appear to accommodate the extraneous variables that are not directly associated with deviant sexual interests, but could otherwise result in a misinterpretation of phallometric response profiles. Thus, the current findings underscore the limited utility of relying solely on mean deviant phallometric responding in the accurate assessment of sexual deviance, while simultaneously highlighting the efficacy of utilizing ratio or difference scores.

3.5.4 Strengths of the current study

A primary strength of the current study was that it addressed a gap in the research literature pertaining to the assessment of sexual deviance among low IQ sex offenders, as this is an area that has historically received little empirical attention (Caparulo, 1991; Clare, 1993; El-Leithy & Webb, 1998; Haavan & Schlank, 2001; O'Connor & Rose, 1999; Schoen & Hoover, 1990). In particular, this study appears to be one of the first to perform a concurrent examination of the possible influences of both IQ and social desirability in the assessment of deviant sexual arousal. As with Study 1, the comprehensive assessment protocol that was utilized at the RTC also allowed for the examination of a wide array of demographic, mental health, offence-specific, and treatment-related characteristics within the current sample. Finally, the current study utilized several different phallometric outcome variables, providing insight into the utility of various approaches to PPG data interpretation as it pertains to the accurate assessment of sexual deviance.

3.5.5 Limitations and avenues for future research

Some of the limitations of the current study may have contributed to the general lack of support for the hypotheses. First, the relatively small sample size of offenders presented a number of limitations. Specifically, the small sample size may have resulted in a lack of sufficient statistical power that would be required to demonstrate significant results. Similarly, the sample was not large enough to allow for separate analyses of rapists and child molesters, and it is possible that differences may have emerged if the two groups were analyzed separately. Additionally, a larger sample size may have provided sufficient statistical power to allow for the examination of discrete offender groups based on IQ score (e.g., IQ scores less than 85 or greater than 115). Potential differences that may be found between such discrete groups would perhaps

be of more practical utility to clinicians, who would then be able to use defined IQ cut-off scores to guide their interpretation of subsequent assessment results.

Second, the use of a high risk/high needs sex offender sample may have also impacted the lack of significant findings. Specifically, a restricted range in PPG responding due to the generally high level of sexual deviance among the study sample may have washed out any potential effects that could be due to differences in IQ or social desirability. It is also possible that, given the unique environment of the RTC as a treatment facility for high risk sex offenders, participants may not have felt the need to attempt to suppress their penile responding to deviant phallometric stimuli, regardless of their intellectual functioning. Specifically, these individuals were likely aware of their status as high risk offenders in need of intensive treatment, and as such they may not have felt that they needed to try and fake their phallometric profiles. Additionally, the particular instructions given to offenders at the RTC prior to undergoing the assessment may have also minimized any potential motivation to suppress deviant arousal. Specifically, offenders were informed that attempts at faking their penile responding would result in a lack of useful treatment-related information and thus such attempts would only be detrimental to them (J. Looman, personal communication, May 31, 2016). Thus, future research would benefit from addressing several of the above-mentioned limitations, including the use of larger and more representative sex offender samples and separate examinations of rapists and child molesters.

The archival nature of the study also presented some limitations. First, the need to create a hybridized IQ score derived from multiple intelligence tests may have resulted in a somewhat inconsistent measure of overall cognitive functioning across the entire sample. In particular, it is not known how well KBIT-2 IQ scores are correlated with WAIS-R IQ scores, and together these measures comprised the large majority of participant test scores (i.e., 58.2% and 26.6%, respectively). As noted in section 3.3.3.2, it was decided to not create or examine hybrid verbal or performance-based subscales of the measures, as the reliability and validity of such hybrid variables would be considerably more questionable than the use of overall IQ scores. Subsequent research would therefore benefit from relying on a single test of intelligence in order to ensure consistency in the assessment of participants' intellectual functioning. Second, as noted in section 3.1.2, participants' level of adaptive functioning (e.g., skills in social and practical domains) was not assessed by the original clinicians. It is noted that individuals' adaptive functioning skills could relate to phallometric responding in a manner that is somewhat

independent from their cognitive ability. Furthermore, the inability to have direct contact with the participants precluded this author from investigating a research question of particular interest. Specifically, while the current study examined the possibility that low IQ offenders may be less likely than average IQ offenders to attempt to suppress penile arousal to deviant stimuli, it would be quite illuminating to determine if these offenders would in fact be less effective at suppressing arousal when explicitly instructed to do so. The possibility that low IQ offenders are less effective at suppressing arousal has been raised by previous researchers (Marshall & Fernandez, 2003; Murphy & Barbaree, 1994; Wormith, 1986), and an early study by Murphy and colleagues (1985) did find a minimal effect of IQ on participants' ability to suppress arousal to phallometric stimuli when instructed to do so.

A fairly recent study shed some light on this issue using a small sample of three child molesters diagnosed with intellectual disability (Singh et al., 2011). The participants in the study were provided with extensive training and practice in the application of mindfulness techniques for controlling deviant sexual arousal. The participants were then instructed to utilize the various cognitive strategies while viewing sexually arousing images from magazines (no explicitly pornographic material was used). The participants provided self-report ratings of sexual arousal following exposure to the stimuli. Over the course of approximately 60 weeks, the participants demonstrated an improved ability to regulate their deviant sexual arousal using various mindfulness strategies. While this study possessed significant limitations (i.e., small case study design, lack of explicit pornographic stimuli, reliance on self-reported arousal), it highlighted the possibility that low IQ individuals may have particular difficulty utilizing cognitive strategies to suppress deviant arousal in the absence of extensive formal training and practice. This is in stark contrast to the large proportion (i.e., upwards of 80%) of participants from general sex offender samples who are able to effectively suppress their arousal to deviant phallometric stimuli without any formal training (Farkas et al., 1979; Freund et al., 1988; Golde et al., 2000; Hall et al., 1988; Howes, 1998; Mahoney & Strassberg, 1991; Murphy & Barbaree, 1994). Thus, further research in this area would be quite informative, as it would have implications for both the assessment and treatment of low IQ sex offenders. For example, additional research would clarify the utility of providing cognitive regulation training to low IQ offenders as a method for managing deviant sexual arousal in real-world situations.

Additional strengths, limitations, and avenues for future research applicable to the overall project are presented in chapter 5. Overall, the findings presented here underscore the need for additional research regarding the impacts of both social desirability and intellectual functioning on phallometric responding.

Chapter 4. Study 3: Age and Phallometric Assessment

4.1 Literature Review

4.1.1 Introduction

The number of aging offenders in federal penitentiaries continues to steadily increase. Between 1993 and 2004 there was a 60% increase in the number of inmates aged 50 and over and an 87% increase in those aged 65 and over (Bouchard, 2004). Furthermore, an earlier study by Uzoaba (1998) reported that nearly 40% of offenders serving life sentences would be 55 years of age or older before being eligible for parole. The most recent statistics from the Office of the Correctional Investigator (OCI, 2015) have indicated that the population of inmates aged 50 and over (termed ‘older offenders’ by CSC) has increased by nearly a third between 2010 and 2014, currently accounting for approximately 25% of Canadian federal inmates. Given that older offenders, including aging sex offenders, are projected to comprise an ever-increasing proportion of the federal offender population, research examining the efficacy of various assessment approaches across the lifespan becomes increasingly important. Specifically, the effective measurement of deviant sexual arousal is a particular concern because of the impact of age on physiological responding, as will be delineated in the following section. As such, ongoing research is required in order to examine the efficacy of phallometric assessment among older sex offenders while also exploring alternative measures of sexual deviance.

4.1.2 Physiological effects of aging on male sexual responding

Before evaluating the efficacy of PPG with older offenders, it is first important to delineate the physiological effects of aging on male sexual arousal. Of particular relevance to the current project is that research which, dating back several decades, has demonstrated the essential role of testosterone in the initiation of male sexual behaviour (e.g., Heim & Hirsch, 1979). Increasing levels of testosterone are correlated with the onset of nocturnal emissions, masturbation, dating, and infatuation among pubescent boys (Kemper, 1990). Furthermore, testosterone levels have been found to correlate with sexual desire in samples of normal men (Anderson, Bancroft, & Wu, 1992; Bagatell, Heiman, Rivier, & Bremner, 1994), adolescent boys (Udry, Billy, Morris, Groff, & Raj, 1985), middle-aged and older men (Davidson et al., 1983), men with erectile dysfunction (Schiavi, White, Mandeli, & Levine, 1997), and hypogonadal men (i.e., those experiencing low levels of total testosterone; O’Carroll, Shapiro, & Bancroft, 1985).

Numerous studies have demonstrated that testosterone levels peak in early adulthood and then decline throughout the remainder of a male's lifespan (Denti et al., 2000; Harman, Metter, Tobin, Pearson, & Blackman, 2001; Jankowska, Rogucka, Medras, & Welon, 2000; Vermeulen, Goemaere, & Kaufman, 1999). Age-related decreases in testosterone levels parallel findings of a decline in the frequency of male sexual behaviour with age, as well as a reduction in the number and quality of erections (Kaiser et al., 1988; Morley et al., 2000). Furthermore, using PPG with a sample of non-offending men ranging in age from 40 to 79 years old, Rowland, Greenleaf, Dorfman, and Davidson (1993) found that the magnitude of erectile response to erotic stimuli decreased, while the latency to maximum response increased, as a function of age. Additionally, the authors noted self-report data indicating significant decreases in the frequency of sexual activity (including intercourse and masturbation) as a function of age. Rowland and colleagues (1993) noted that significant changes in sexual physiological responding and corresponding behaviour tended to begin in late middle age.

4.1.3 Sexual offending across the lifespan

While nearly all sex offenders are likely to experience a decrease in sexual activity as they age (including non-consensual sexual behaviour), some may continue to pose a significant risk to society throughout the majority of their lifespan. Still, much of the research regarding older offenders in general has focused on their decreased risk of recidivism, and this is also true of sex offenders (Barbaree & Blanchard, 2008; Hanson, 2002; Hanson, 2005). Several researchers have noted that sexual recidivism appears to decrease in a linear fashion from approximately age 25 to age 70 (Barbaree, Blanchard, & Langton, 2003; Fazel, Sjostedt, Langstrom, & Grann, 2006; Hanson, 2005; Hanson, 2006; Thornton, 2006). This is reflected in the assessment of sexual recidivism risk. For example, research on the original Static-99, the most widely-used actuarial risk tool for estimating sex offender recidivism risk, found that older offenders had lower sexual recidivism rates than would be expected based on their rating on the measure (Hanson, 2006). As such, the updated Static-99R requires the assessor to reweight offenders' overall risk rating based on their age at release in order to improve the predictive accuracy of the measure among older offenders (Helmus, 2009). However, despite a general reduction in rates of reoffending among aging sex offenders, recidivism is still documented among offenders upwards of 65 years of age (Hanson, 2005; Hanson, Steffy, & Gauthier, 1993; Prentky, Lee, Knight, & Cerce, 1997). Furthermore, in their seminal meta-analysis, Hanson and

Bussiere (1998) identified only a moderate negative relationship between sexual recidivism and age ($r = -.13$). As Harris and Rice (2003) have stated,

[T]he preponderance of scientific evidence supports the idea that the majority of variance in violent criminal conduct (including sexual aggression) can be attributed to genetically and physiologically based enduring traits that, once initiated, exhibit lifelong persistence under conditions so far observed (p. 208).

As this quote highlights, the persistence of sexual offending across the lifespan remains a significant concern for those working with sex offender populations.

4.1.4 Persistence of sexual deviance across the lifespan

While recidivism rates may decline as a function of age, it is unlikely that sex offenders experience a qualitative change in their sexual preferences. Rather, it may be assumed that sex offenders' deviant sexual interests (analogous to non-deviant interests among the general population) are likely deeply engrained and not amenable to significant change (as seen in the various theories outlined in section 1.6). As a poignant example of this assertion, Seto (2012) argued that pedophilia should be conceptualized as an age-based sexual orientation. He pointed to various aspects of sexual orientation, drawing parallels between heterosexuality, homosexuality, and pedophilia in terms of age of onset of orientation, romantic behaviour, and, particularly, the stability of sexual interests over time. Furthermore, an older study found that the frequency, duration, and rigidity of nocturnal erections among normal males declined with age (Karacan, Salis, Thornby, & Williams, 1976). Given that these differences in erectile responding occurred in the absence of any erotic stimuli, the results can be taken to suggest that age-related changes in sexual behaviour corresponded with biological (rather than psychological) mechanisms. Finally, as previously noted, despite a negative correlation between age and recidivism, older offenders have still been found to commit sexual offences, further suggesting that deviant sexual interests, at least for some sex offenders, are likely maintained throughout the lifetime.

Rather than experiencing a change in deviant sexual interests *per se* (and thus refraining from inappropriate sexual behaviour), it is much more likely that sex offenders, like criminal offenders in general, are subject to a variety of factors that decrease their likelihood of engaging in criminal activity (e.g., decreased physical ability to commit crime, a lower degree of

impulsivity, etc.; Doren, 2006). As noted, reduced testosterone levels may play a particularly critical factor in the lower rates of recidivism among older sex offenders.

4.1.5 Assessing deviant arousal across the lifespan

Given that recidivism is documented among sex offenders upwards of 65 years old (Hanson, 2002), and that deviant sexual arousal is the strongest predictor of sexual recidivism (Hanson & Morton-Bourgon, 2005), the accurate assessment of deviant arousal across the lifespan is particularly important. However, taking into account age-related decreases in physiological arousal, it is important to again refer to the work of Singer (1984) and Rempel and Serafini (1995) in distinguishing between sexual desire and sexual response. As outlined in section 1.5.2, sexual desire refers to a psychological process involving anticipation, motivation, and imagery, whereas a sexual response simply entails physiological arousal. Applying this framework to the assessment of sexual deviance, sexual desire would be comprised of the individual's deviant sexual interests, desires, and preferences (independent of physiological arousal), whereas the sexual response would consist of the corresponding physiological reactions of arousal (e.g., penile tumescence).

As noted in section 1.8.6.3, phallometric assessment uses measurements of penile tumescence in order to infer a participant's sexual preferences. However, such an assessment only uses one indicator of arousal (i.e., penile tumescence), while neglecting several other potential indicators of an individual's sexual preferences (e.g., gaze and facial expression, aesthetic ratings, unconscious cognitive processes, etc.; Merdian & Jones, 2011).

While the research regarding the construct validity of phallometric assessment is certainly not definitive, the utility of the measure with aging offenders is particularly dubious given the documented reductions in erectile magnitude and increasing latency to maximum penile responding that occurs after age 50 (Rowland et al., 1993). Indeed, researchers have found that arousal to phallometric stimuli steadily decreases as a function of age (Castonguay, Proulx, Aubut, MicKibben, & Campbell, 1993). Furthermore, in a study using volumetric PPG, Blanchard and Barbaree (2005) found that the amplitude of penile responding among a sample of sex offenders declined in a curvilinear fashion from ages 13 to 79. Such results suggest that although older sex offenders likely retain their deviant sexual interests, decreasing sexual functionality may prevent them from becoming significantly physiologically aroused when

exposed to sexual stimuli. Thus, the accurate assessment of sexual deviance among aging offenders may require the use of measures that do not rely solely on penile responding.

As previously noted in section 1.9, several other measures of sexual deviance have been developed (e.g., card sort tasks, viewing time paradigms, modified Stroop tasks, measures of galvanic skin response, groin temperature, and pupil size), however the majority of these are either in their infancy, or are prone to many of the same problems as penile plethysmography (Kalmus & Beech, 2005). Perhaps the most viable alternative to PPG is use of self-report measures such as the MSI. Given that the MSI assesses offenders' sexual preferences via self-report and does not rely on physiological responding, it may serve as a more appropriate measure of sexually deviant interests across the lifespan and thus aid in more accurate predictions of recidivism (please refer to section 1.9.5 for a review of the psychometric properties of the MSI).

4.2 Purpose and Hypotheses for Study 3

The primary purpose of the current study was to add to the existing empirical literature regarding the relationship between age and phallometric responding, while also attempting to provide additional support for the efficacy of the MSI as an alternative measure of sexual deviance among older offenders. The first objective was to attempt to repeat the results of previous research, and as such it was hypothesized that age would be significantly negatively correlated with deviant phallometric responding (e.g., Blanchard & Barbaree, 2005; Castonguay et al., 1993; Hanson & Bussiere, 1998). Second, based on previous research which has highlighted the association between various MSI scores and phallometric responding (Bernard et al., 1989; Stinson & Becker, 2008; Tong, 2007), it was hypothesized that participants' Rape (R) or Child Molest (CM) MSI scale scores (for rapists and child molesters, respectively) would be significantly positively correlated with the corresponding (rape or child molester) deviant PPG responses, while MSI Lie (L) scale scores would be significantly negatively correlated with deviant responding. Finally, as an extension of previous research, it was hypothesized that age would continue to make a significant contribution to the prediction of deviant phallometric responding after controlling for MSI R or CM scores; such results would indicate that phallometric assessment may not be an appropriate measure of deviant sexual interest among older offenders. Taken together, these findings would highlight the importance of considering an offender's age before conducting a phallometric assessment, while also providing further support

for the use of the MSI as a viable alternative to PPG in the assessment of sexual deviance among older offenders.

As delineated in section 4.3.3.2, the current study examined rapists and child molesters separately. However, it is noted here that the above hypotheses rested on the assumption that penile responding to phallometric stimuli would primarily be influenced by the physiological changes associated with aging, regardless of an offender's predilection for non-consenting sex with adults or sex with children. Specifically, while pedophilia, in contrast to a predilection for sexually aggressive behaviour with adults, may reflect an enduring sexual orientation (Seto, 2012) that has been associated with structural brain abnormalities (e.g., Cantor et al, 2008), it was assumed that child molesters and rapists would both demonstrate reduced deviant PPG responding as a function of age. Thus, the above hypotheses were applied to both rapists and child molesters.

4.3 Methodology

4.3.1 Participants

The participants for the current study were derived from the sample of RTC sex offenders as outlined in sections 2.3.3.1 and 3.3.1, and included 382 participants. Regarding their sexual offence history, the overall sample was comprised primarily of rapists (63.4%, $n = 242$), followed by child molesters (31.4%, $n = 120$) and mixed offenders (5.2%, $n = 20$). The mean age of the overall sample was 38.2 years old ($SD = 9.7$). Participants classified as young offenders (i.e., age < 50, $n = 338$) had a mean age of 35.9 ($SD = 7.6$), while the old offender group (i.e., age ≥ 50 , $n = 44$) had a mean age of 55.6 ($SD = 5.1$). Additional characteristics of the overall sample are provided in the results section.

4.3.2 Measures

4.3.2.1 PPG

As part of a standard assessment battery, all of the offenders in the current study participated in a phallometric assessment, as delineated in section 2.3.2.1. As with study 2, the current study relied only on auditory PPG stimuli as described in section 3.3.2.1.1.

4.3.2.2 MSI

The MSI (Nichols & Molinder, 1984) is a standardized 300-question self-report inventory designed to assess psychosexual characteristics among sexual offenders; the measure takes approximately 45 minutes to administer. As reviewed in detail in section 1.9.5, researchers have

demonstrated that the MSI is a reliable and valid instrument in the assessment of sex offending characteristics (e.g., Craig et al., 2006; Kalichman et al., 1992). The current study utilized participants' scores on the Rape (R) Child Molest (CM), and Lie (L) scales. The R and CM scales represent two of the central sexual deviance measures that comprise the MSI, and as the authors note, the scales "are designed to help identify the universal cognitions and behaviors of the sexual offender" (Nichols & Molinder, 1984, p. 16). Both scales examine various elements of sexual deviance, including sexual fantasies, cruising/grooming and assaultive behaviours, and the degree of force used during the commission of the offending behaviour. Specifically, the CM scale is designed to assess participants' pedophilic sexual fantasies, their method of identifying victims, their use of manipulative and coercive strategies aimed at gaining compliance from their victims (e.g., the use of a "nice-man" (p. 17) image and the minimization of the offending behaviour so as not to frighten the victim), and the style and magnitude of the assault (e.g., genital exposure, forced penetration of the victim, etc.). In a similar fashion, the R scale is designed to assess a four stage pattern of rape (i.e., the presence of deviant sexual fantasies and the use of reinforcing masturbatory practices, strategies for identifying victims, and the nature of the sexually assaultive behaviour).

The MSI also contains four Lie scales, each being related to a specific form of sexually deviant behaviour (i.e., child molestation, rape, exhibitionism, and incest). The purpose of the Lie scales is to "measure the openness versus dishonesty regarding the sex offender's sexually deviant thoughts and behaviors" (Nichols & Molinder, 1984, p. 27). Offenders with low scores on the Lie scales tend to be open about their sexually deviant interests and admit to finding deviant behaviour pleasurable, while high scorers are likely to be dishonest regarding their deviant interests and behaviour. The current study utilized participants' scores on the child molester and rape Lie scales, depending on offenders' classification. While a subset of the child molesters included in the current sample were identified as incest offenders, it was decided to use their score on the child molester Lie scale rather than their score on the incest Lie scale, as the authors of the MSI noted in the technical manual that the incest scale contains only four items and that the scale has not been normed (Nichols & Molinder, 1984).

4.3.3 Procedure

4.3.3.1 Data collection, ethical approval, and PPG testing procedure

Readers are referred to sections 2.3.3.1, 2.3.3.2, and 2.3.3.3 for a description of data collection, ethical approval, and PPG testing procedures. Only auditory stimuli were utilized for the purposes of the current study in order to allow for identical data analyses to be conducted in both the rapist and child molester samples, and as such the description of visual stimuli presentation described in section 2.3.3.3 was not applicable here.

4.3.3.2 Data preparation

Data preparation was consistent with the description provided in section 3.3.3.2, including the rationale for using PFE ratio and differential variables, as well as for the participant inclusion criteria based on phallometric responding. Unlike Studies 1 and 2 however, the current study had sufficient sample sizes of both rapists and child molesters to allow for separate analyses based on offender type.⁶ Following from this, participants' PPG responding to the female sexual violence stimuli set was utilized for the rapist sample, while responding to the child sexual violence stimuli set was utilized for the child molester sample.

Additionally, as with Study 2, the initial hypothesis-related results of the correlational and regression analyses led this author to consider the possibility that the transformation of phallometric PFE responding into ratio and difference scores may have controlled for the magnitude of participants' deviant responding, thus possibly eliminating potential differences in responding that may have existed as a function of age and/or MSI scores. As such, the analyses were re-run using untransformed PFE response variables (both deviant and appropriate responding). The process for calculating the untransformed PFE variables was similar to that described in section 3.3.3.2; however, given the sufficient samples sizes of rapists and child molesters/mixed offenders, separate variables were created and analyzed for each sample using the relevant stimuli based on offender type.

Finally, total scores for the MSI R and CM scales were calculated, as this had not been done by the original researchers. As with the PPG stimuli, the choice of scale utilized for each set of analysis was based on offender type (i.e., the R scale was used for rapists, while the CM scale was used for child molesters/mixed offenders).

⁶ Mixed offenders were included in the child molester sample, as overall they demonstrated stronger arousal to the child stimuli relative to the rape stimuli.

4.3.3.3 Analyses

Rather than rely on somewhat arbitrary distinctions between young and old participants, it was decided to examine age as a continuous variable using correlation and regression analyses in order to test the hypotheses of the current study. However, initial exploratory analyses (i.e., chi-square and independent samples t-tests) were conducted in order to elucidate potential differences between young and old offenders on a variety of socio-demographic, mental health, offence, and treatment-related characteristics. For these initial analyses, an age cut-off of 50 and above was used for the old offender group. The decision to use an age cut-off of 50 was based on several factors. First, CSC defines older offenders as those aged 50 and over. Second, the research highlighted in previous sections has generally demonstrated that sexual physiological responding tends to begin to significantly decrease in late middle age (i.e., approximately age 50). Finally, while age cut-offs greater than 50 were considered, the small number of offenders from the current sample who were aged 50 or above precluded the use of higher age cut-offs. Hence, it was necessary to use an age cut-off of 50 in order to potentially capture various age-related or generational differences while still maintaining adequate samples sizes in both the young and old offender groups. As noted, the use of such a cut-off was only for the purposes of initial exploratory analyses, and was not relevant to the subsequent hypothesis-driven analyses. These initial analyses examined the overall sample of 382 offenders. An additional independent samples t-test was used to determine if there was a significant difference in age between rapists and child molesters.

The subsequent correlational analyses incorporated a variety of relevant variables (i.e., offence history, level of denial regarding offence, number of previous sex offender treatment programs completed, number of prior PPG assessments) in order to examine their potential associations with deviant phallometric responding; this set of variables also included those that were directly related to the first three hypotheses of the current study (i.e., participant age and MSI R, CM, and L scale scores). Hierarchical multiple regression analyses were then conducted in order to determine the contributions of age and MSI R or CM scores to the prediction of deviant phallometric responding. Specifically, these MSI scores were added in the first step of the regression, while age was added in the second step.

4.4 Results

4.4.1 Descriptive results

As can be seen in Table 4.1, young and old offenders differed in several respects. As a group, old offenders rated higher on a number of historical variables that would be expected with lengthier life spans, including the likelihood of ever being married, their number of total incarceration periods, their number of sexual and violent convictions, and the number of PPG assessments that they had previously completed. Furthermore, again as expected, old offenders were significantly older at the time that they committed their current offence and at the time of the current assessment. Young offenders were, on average, younger at the time of their first arrest and were more likely to have a history of drug abuse. Finally, the young offender group was comprised of a significantly larger proportion of rapists. Examining potential age differences based on offender type, the results of the independent samples t-test indicated that there was no significant difference in age between rapists ($M = 37.7$, $SD = 8.7$) and child molesters ($M = 39.0$, $SD = 11.1$), $t(380) = -1.22$, $p = .225$.

4.4.2 Hypothesis testing

4.4.2.1 Rapists

As shown in Table 4.2, the results of the Pearson's correlations indicated that the PFE ratio and differential scores were significantly and strongly positively correlated with one another in the rapist sample. Furthermore, MSI R scores were significantly positively correlated with both PFE ratio and difference scores, while MSI L scores were significantly negatively correlated with PFE difference scores. Both MSI R and L scores were also significantly correlated with a number of other offence-related variables, including sexual offence history, level of offence denial, and offenders' previous number of phallometric assessments and completed sex offender treatment programs. Finally, age was not correlated with either PFE variable.

The results of the initial regression analyses indicated that age was not a significant predictor of PFE ratio scores, $F(1, 240) = .332$, $p = .565$, adj. $R^2 = -.003$, or PFE differential scores, $F(1, 240) = .978$, $p = .324$, adj. $R^2 = .000$; these results were expected given the initial non-significant correlations. As demonstrated in Table 4.3, MSI R scores were a significant predictor of both PFE ratio and differential scores, while age did not add significantly to the prediction of phallometric responding in either model. However, while the overall multiple

Table 4.1
Study 3 Sample Characteristics

Variable	Overall		Young (< 50)		Old (≥ 50)		<i>t</i> or χ^2
	<i>n</i>	<i>M</i> (<i>SD</i>) or %	<i>n</i>	<i>M</i> (<i>SD</i>) or %	<i>n</i>	<i>M</i> (<i>SD</i>) or %	
<u><i>Socio-demographics</i></u>							
Completed at least grade 12	337	18.4	296	17.2	41	26.8	2.21
Ever married	352	60.5	308	57.1	41	84.1	11.70***
History of drug abuse	366	62.0	323	65.6	43	34.9	15.24***
History of alcohol abuse	370	73.6	326	76.4	44	75.0	.04
Sexually abused as child	340	53.2	299	53.8	41	48.8	.37
Physically abused as child	330	58.5	288	59.0	42	54.8	.28
Witnessed sexual abuse as child	231	22.5	198	23.7	33	15.2	1.20
Witnessed physical abuse as child	271	54.2	234	55.6	37	45.9	1.12
Age at first exposure to sex	271	14.0 (3.8)	239	13.7 (3.3)	32	15.8 (6.1)	-1.90
<u><i>Mental Health</i></u>							
No. prior psychiatric admissions	264	1.5 (1.9)	229	1.5 (1.9)	35	1.3 (1.6)	.47
Previous psychiatric treatment	339	33.0	300	33.7	39	28.2	.47
Diagnosed personality disorder	319	55.8	283	54.1	36	69.4	3.06
Diagnosed psychosis	319	8.8	283	8.5	36	11.1	.28 [†]
Diagnosed mood disorder	319	3.4	283	3.2	36	5.6	.54 [†]
Diagnosed substance abuse disorder	319	8.5	283	7.4	36	16.7	3.50 [†]
Diagnosed paraphilia	319	18.5	283	18.4	36	19.4	.02
<u><i>Criminal History</i></u>							
Age at first arrest	382	19.4 (6.3)	338	18.9 (5.1)	44	23.9 (11.0)	-3.00**
No. federal incarcerations	382	1.7 (1.0)	338	1.6 (1.0)	44	2.1 (1.2)	-2.67**
No. sexual convictions	382	3.5 (4.6)	338	3.2 (4.2)	44	5.8 (6.4)	-2.63*
No. violent convictions	382	5.7 (4.9)	338	5.4 (4.6)	44	8.2 (5.9)	-3.05**
No. nonviolent convictions	382	14.3 (14.9)	338	14.3 (13.9)	44	14.2 (21.6)	.05
<u><i>Current Offence-related</i></u>							
Age at offence	371	30.8 (8.7)	330	29.54 (7.3)	41	41.2 (11.5)	-6.36***
Length of sentence (years)	297	6.4 (5.0)	273	6.1 (4.4)	24	9.7 (8.9)	-2.01
Drugs/alcohol related to offence	342	67.0	301	68.4	41	56.1	2.48
<u><i>Offender Classification</i></u>							
Rapist	382	63.4	338	64.9	44	47.7	4.92*
Child molester	382	31.4	338	30.1	44	45.5	4.24*
Mixed	382	5.2	338	5.0	44	6.8	.26 [†]
<u><i>Treatment-related</i></u>							
Age at assessment	382	38.2 (9.7)	338	35.9 (7.6)	44	55.6 (5.1)	-22.73***
No. prior PPG assessments	281	1.2 (1.3)	251	1.1 (1.2)	30	1.6 (1.4)	-2.05*
Admits to deviant fantasies	270	49.6	239	49.8	31	48.4	.02
No. prior SO programs completed	289	.8 (1.0)	257	.7 (1.0)	32	.9 (1.1)	-.88
Post-PPG txt completion	266	77.1	234	76.5	32	81.3	.36

* Significant age group difference at the $p \leq .05$ level. ** $p \leq .01$. *** $p \leq .001$.

[†] Chi-square contained at least one cell with expected count < 5.

Table 4.2

Means, Standard Deviations, and Intercorrelations for PPG Outcome Measures and Relevant Offender Variables in a Rapist Sample

Variable	<i>M (SD)</i>	1	2	3	4	5	6	7	8	9	10	11
1. PPG ratio score <i>n</i>	.9 (.5) 242	-										
2. PPG diff. score <i>n</i>	-7.4 (21.8) 242	.71***	-									
3. Age <i>n</i>	37.7 (8.7) 242	.04	.06	-								
4. MSI R <i>n</i>	5.3 (5.2) 242	.20**	.13*	.03	-							
5. MSI L <i>n</i>	10.5 (2.5) 242	.02	-.17***	-.10	-.86***	-						
6. No. sexual convictions <i>n</i>	2.4 (3.1) 242	.07	.11	.12	.22***	-.23***	-					
7. No. violent convictions <i>n</i>	5.0 (4.1) 242	.11	.11	.23***	.10	-.06	.72***	-				
8. No. nonviolent convictions <i>n</i>	15.6 (14.3) 242	-.04	-.01	.03	-.07	.13	-.02	.23***	-			
9. Level of offence denial <i>n</i>	- 196	.01	-.04	.01	.35***	-.35***	.01	-.06	-.04	-		
10. No. prior SO programs <i>n</i>	.7 (1.0) 195	.10	.14*	.17*	.36***	-.29***	.39***	.26***	-.14*	.24**	-	
11. No. prior PPG Ax. <i>n</i>	1.1 (1.3) 190	.11	.04	.26***	.29***	-.26***	.37***	.30***	-.11	.24**	.66***	-

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Table 4.3

Hierarchical Regression Analysis Summary for Age and MSI R Scores Predicting Phallometric Responding in a Rapist Sample

Ratio score predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.04 (.03)**	
MSI R score	.02	.01	.20**		
Step 2:				.04 (.03)**	.00
Age	.00	.00	.03		
Diff. score predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.02 (.01)*	
MSI R score	.56	.27	.13*		
Step 2:				.02 (.01)	.00
Age	.15	.16	.06		

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

regression model for PFE ratio scores remained significant subsequent to the addition of age in step 2, this was not the case for the difference score model; this finding is consistent with the initial correlational analyses, as MSI scores demonstrated a stronger correlation with ratio responding relative to differential responding.

As alluded to in section 4.3.3.2, the lack of any significant relationship between age and deviant phallometric responding highlighted the possibility that the use of PFE ratio and differential scores may have eliminated potential differences in responding that could have been due to age (similar to the rationale detailed in section 3.4.2). Therefore, as noted previously, several of the above analyses were re-run using untransformed PFE response variables (the process for creating these variables was described in section 3.3.3.2). The results of the Pearson's correlations indicated that age was significantly negatively correlated with both mean PFE responding to deviant stimuli, $r = -.16, p = .012$, and mean PFE responding to appropriate responding, $r = -.16, p = .013$. MSI R scores were not correlated with age, $r = .03, p = .594$, deviant PFE responding, $r = .08, p = .201$, or appropriate PFE responding, $r = -.04, p = .532$. MSI L scores were also not correlated with deviant PFE responding, $r = -.09, p = .171$, or appropriate PFE responding, $r = .01, p = .869$. As shown in Table 4.4, the two subsequent multiple regression models were quite similar in that MSI R scores did not make a significant contribution to either model, while age was a significant predictor of both deviant and appropriate PFE responding and accounted for approximately 3% of the variance in responding in both models.

4.4.2.2 Child molesters

As with the rapist sample, the results of the Pearson's correlations indicated that the PFE ratio and differential scores were significantly and strongly positively correlated with one another in the child molester sample (see Table 4.5). Similarly, MSI CM scores were also significantly positively correlated with both PFE ratio and difference scores, while MSI L scores were significantly negatively correlated with both PFE variables. Both MSI CM and L scores were also correlated with several offence-related variables, including offence history, level of offence denial, and offenders' previous number of phallometric assessments and completed sex offender treatment programs. Unlike with rapists, age was significantly negatively correlated with PFE difference scores in the child molester sample.

Table 4.4

Hierarchical Regression Analysis Summary for Age and MSI R Scores Predicting Mean PFE Responding in a Rapist Sample

Deviant PFE predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.01 (.00)	
MSI R score	.16	.12	.08		
Step 2:				.04 (.03)*	.03*
Age	-.19	.07	-.17**		
Appropriate PFE predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.00 (-.00) [†]	
MSI R score	-.11	.18	-.04		
Step 2:				.03 (.02)*	.03*
Age	-.27	.11	-.16*		

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

[†] Full adjusted R^2 value = -.003.

Table 4.5

Means, Standard Deviations, and Intercorrelations for PPG Outcome Measures and Relevant Offender Variables in a Child Molester Sample

Variable	<i>M (SD)</i>	1	2	3	4	5	6	7	8	9	10	11
1. PPG ratio score <i>n</i>	2.5 (2.7) 140	-										
2. PPG diff. score <i>n</i>	12.1 (16.4) 140	.57***	-									
3. Age <i>n</i>	39.0 (11.1) 140	-.12	-.27***	-								
4. MSI CM <i>n</i>	12.9 (9.9) 140	.19*	.27**	.12	-							
5. MSI L <i>n</i>	7.6 (4.4) 140	-.20*	-.23**	-.07	-.86***	-						
6. No. sexual convictions <i>n</i>	5.6 (5.9) 140	.03	-.07	.28***	.30***	-.28***	-					
7. No. violent convictions <i>n</i>	6.9 (5.8) 140	.00	-.09	.33***	.27***	-.25**	.96***	-				
8. No. nonviolent convictions <i>n</i>	12.1 (15.8) 140	-.09	-.02	.01	-.21*	.20*	-.20*	-.16	-			
9. Level of offence denial <i>n</i>	- 129	.03	-.04	-.02	.28***	-.25**	.03	.01	-.03	-		
10. No. prior SO programs <i>n</i>	.8 (1.1) 93	.24*	.19	.09	.36***	-.25*	.15	.14	.01	.32**	-	
11. No. prior PPG Ax. <i>n</i>	1.3 (1.2) 90	.20	.03	.14	.39***	-.32**	.16	.11	-.05	.42***	.72***	-

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

The results of the initial regression analyses indicated that age was not a significant predictor of PFE ratio scores, $F(1, 138) = 1.861, p = .175$, adj. $R^2 = .006$; however age was a significant predictor of PFE differential scores, $F(1, 138) = 10.832, p = .001$, adj. $R^2 = .066$. As demonstrated in Table 4.6, MSI CM scores were a significant predictor of both PFE ratio and differential scores, however age only made a significant contribution to the difference score model; these results are consistent with the initial correlational analyses, as age was not found to be correlated with ratio scores. While both models remained significant predictors of phallometric responding at step 2, MSI scores and age accounted for approximately three times more variance in the difference score model relative to the ratio score model (16% and 5%, respectively).

In order to remain consistent with the analyses conducted within the rapist sample, it was decided to re-run several of the above analyses using untransformed PFE response variables. The results of the Pearson's correlations indicated that age was significantly negatively correlated with both mean PFE responding to deviant stimuli, $r = -.29, p = .001$, and mean PFE responding to appropriate responding, $r = -.27, p = .002$. MSI CM scores were not significantly correlated with age, $r = .11, p = .208$, or appropriate PFE responding, $r = .15, p = .087$, but were significantly positively correlated with deviant PFE responding, $r = .30, p < .001$. MSI L scores were significantly negatively correlated with both mean deviant PFE responding, $r = -.27, p = .001$, and mean appropriate PFE responding, $r = -.23, p = .007$. As shown in Table 4.7, age made a significant contribution to both subsequent multiple regression models after controlling for MSI CM scores in step 1, however MSI CM scores only made a significant contribution to the prediction of deviant PFE responding. Accordingly, while both overall multiple regression models were significant, nearly 10% more variance was accounted for in the deviant PFE model than in the appropriate PFE model.

4.5 Discussion

4.5.1 Group demographic differences

A number of differences were found between old and young offenders, as old offenders were more likely to have been married, had lengthier criminal histories and a greater number of previous PPG assessments, and were older at the time that they committed their current offence; such differences would be expected given that older offenders, as a group, had a relatively extended period of time within which to engage in criminal behaviour, receive treatment, and so

Table 4.6

Hierarchical Regression Analysis Summary for Age and MSI CM Scores Predicting Phallometric Responding in a Child Molester Sample

Ratio score predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.03 (.03)*	
MSI CM score	.05	.02	.12*		
Step 2:				.05 (.04)*	.02
Age	-.03	.02	-.14		
Diff. score predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.07 (.06)**	
MSI CM score	.44	.14	.27**		
Step 2:				.16 (.15)***	.09***
Age	-.45	.12	-.30***		

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Table 4.7

Hierarchical Regression Analysis Summary for Age and MSI CM Scores Predicting Mean PFE Responding in a Child Molester Sample

Deviant PFE predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.09 (.08)***	
MSI CM score	.45	.13	.30***		
Step 2:				.20 (.19)***	.11***
Age	-.46	.11	-.34***		
Appropriate PFE predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.02 (.01)	
MSI CM score	.22	.13	.15		
Step 2:				.11 (.09)***	.08***
Age	-.38	.11	-.29***		

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

forth. Additionally, old offenders were less likely to have a history of drug abuse; this result is consistent with the findings from a large-scale survey of American offenders ($n = 10,952$) conducted by Arndt, Turvey, and Flaum (2002), who found that the majority of older offenders (i.e., 85%) were characterized by alcohol abuse problems, while the abuse of any other substances was relatively rare among this population. Finally, old offenders from the current sample were more likely to have committed a sex offence against a child victim, while young offenders more often committed rape; this result is consistent with that of Hanson (2001), who also found that rapists were generally younger than child molesters and that they also demonstrated a reduction in recidivism at an earlier age. Hanson (2001) posited three primary factors to explain these findings; namely, sexual deviancy, self-control, and opportunity. Specifically, he suggested that rapists experience an increase in self-control during young adulthood, a decrease in deviant sexual drive in late adulthood, and a gradual decline in offending opportunities throughout; as such it is reasonable that the majority of rapists are young and that their risk for reoffending steadily declines with age. In contrast, while extrafamilial child molesters also develop improved self-control in young adulthood, the opportunities for child molestation likely increase. As such, it is not until late adulthood, when both an individual's sexual drive and opportunities for relationships with children are reduced, that recidivism rates begin to decline.

4.5.2 Phallometric responding, age, and MSI scores

4.5.2.1 Rapists

The findings of the current study in the rapist sample provided only mixed support for the hypotheses that were set forth. Specifically, there was partial support for the first hypothesis, as age was not found to be correlated with either PFE ratio or difference scores, but was negatively correlated with mean PFE responding to both deviant and appropriate stimuli. Similar to the rationale provided in study 2, these results suggest that the use of difference scores and ratio scores accomplished their purpose, in that they accommodated for the influence of age on phallometric responding and thus resulted in a more accurate assessment of deviance. Overall then, these results are generally consistent with previous research which has demonstrated that penile responding to phallometric stimuli decreases with age (Blanchard & Barbaree, 2005; Castonguay et al., 1993; Hanson & Bussiere, 1998).

In support of the second hypothesis, MSI R scores were found to be positively correlated with both PFE ratio and difference scores, which is consistent with previous research that has demonstrated correlations between phallometric responding and the sexual deviance scales of the MSI (Bernard et al., 1989; Stinson & Becker, 2008; Tong, 2007). Furthermore, there was some support for the third hypothesis, as MSI L scale scores were correlated with PFE difference scores, but not with ratio scores. Interestingly, neither MSI R nor L scale scores were found to be correlated with mean PFE responding, a finding which is difficult to explain given that both scales were correlated with at least one of the transformed PFE variables. Regardless, overall these results point to the efficacy of the MSI as a measure of sexual deviance (as explicated further in section 4.5.2.3).

There was support for the fourth hypothesis when relying on mean PFE responding, as age accounted for a significant proportion of variance in both deviant and appropriate mean PFE responding. However, age did not make a significant contribution to the prediction of either PFE ratio or difference scores. Such results make intuitive sense, as one would expect that the overall strength of penile responding would decrease with age, as explicated in previous sections. In contrast, by examining an individual's deviant phallometric responding relative to their responding to appropriate stimuli, the physiological effects of age on the overall magnitude of penile responding are controlled for. Once again then, these results point to the importance of utilizing PPG data transformations in order to accurately assess the relative strength of offenders' sexual preferences. The current results suggest that the use of either ratio or difference scores would be appropriate among rapist samples.

4.5.2.2 Child molesters

There was generally more support for the study hypotheses within the child molester sample in comparison to the rapist sample. Specifically, in support of the first hypothesis, age was found to be negatively correlated with all of the PPG outcome variables except for PFE ratio scores. Once again, it would appear that the use of PPG data transformations (specifically ratio transformations in this case) is an effective means of accommodating the effects of extraneous variables. Overall however, these results provide further evidence for the significant age-related impacts on physiological arousal to phallometric stimuli.

In support of the second and third hypotheses, MSI CM scores were positively correlated with ratio, difference, and mean deviant PFE response variables, while MSI L scores were

negatively correlated with all of the PPG outcome variables. Such findings provide strong support for the use of the MSI as a measure of sexual deviance, as discussed further below.

Finally, the fourth hypothesis was generally supported, as age accounted for a significant proportion of the variance in all of the PPG outcome variables except for ratio scores, including when controlling for MSI CM scores. As with the rapist sample, these results point to the important function that is served by use of PPG data transformations, as they accommodate for the age-related effect of decreasing magnitude of penile responding. Unlike with the rapists however, in which both ratio and difference scores appeared to accommodate the effect of age, the findings among the child molester sample suggest that ratio scores may be a more appropriate data transformation procedure with child molesters.

4.5.2.3 Overall review of the MSI

Importantly, the results of the current study highlighted the utility of the MSI as a measure of sexual deviance among both rapists and child molesters. Specifically, the MSI R and CM scales, which represent the primary sexual deviance scales of the measure, were both significantly positively correlated with PFE ratio and difference scores within the respective rapist and child molester samples. The correspondence between offenders' physiologically-assessed arousal and their self-reported sexual interests and behaviours highlights the construct validity of the MSI as a measure of deviance. Furthermore, with the exception of PFE ratio scores in the rapist sample, the MSI L scales were significantly negatively correlated with the transformed PFE variables among both rapists and child molesters, indicating that penile responding decreased as offenders' attempts at dissimulation on the MSI increased. These findings point to the ability of the MSI to identify individuals who are not forthcoming regarding their deviant interests and behaviours and who are likely attempting to suppress their deviant physiological responding in a corresponding manner. The lack of correlation between PFE ratio scores and MSI L scores among rapists may have been a result of the comparatively limited range of variance in deviant responding among these offenders relative to the child molester sample. As a result, it is possible that the nature of the ratio score transformation, in comparison to the difference score transformation, further reduced the variance in phallometric responding so as to eliminate any relationship between rapists' physiological arousal and their degree of openness on the MSI as measured by the L scales.

Returning to the efficacy of the MSI, not only were R, CM, and L scores correlated with PPG-assessed deviant arousal, but offenders' scores on these scales were also correlated with a number of other salient indicators of sexual deviance, including sexual offence, assessment, and treatment history, and offenders' level of denial regarding the commission of their current sex offence. It is particularly noteworthy that MSI L scores were negatively correlated not only with deviant phallometric arousal but also with offenders' level of offence denial,⁷ as the validity of self-report deviance measures among offender populations is often questioned due to the sensitive and high-stakes nature of such assessments. Again, the current results highlight the ability of the L scales to provide important insight into offenders' openness about their deviant sexual interests and behaviours.

Additionally, within the context of the primary focus of the current study, MSI scores were not correlated with offenders' age in either the rapist or child molester sample, indicating that the measure is a useful assessment tool across the lifespan. Finally, the correlation between MSI scores and sexual offence history provide some support for the postdictive validity of the measure as it pertains to its association with deviant sexual behaviour. Consistent with the appraisals of previous researchers then, the current results point to the efficaciousness of the MSI in assessing sexual deviance (e.g., Craig et al., 2006; Kalmus & Beech, 2005).

4.5.3 Strengths of the current study

As with Studies 1 and 2, the current study benefited from the wealth of data available from the RTC, which allowed for the examination of differences between young and old offenders on a number of salient variables. Furthermore, the current study also utilized a number of different PPG variables, once again highlighting importance differences in the findings that occurred depending on the variable choice. In particular, to the best of the current researcher's knowledge, this is the first study to examine PFE difference scores in the context of aging. Outside of these common strengths, the current study was also characterized by additional advantages. Specifically, the research objectives of the current study allowed for the utilization of a much larger sample of offenders in comparison to the previous studies, both improving statistical power and allowing for a separate examination of rapists and child molesters. The

⁷ As shown in Tables 4.2 and 4.5, MSI L scores were negatively correlated with offenders' level of offence denial; this variable was coded in the dataset as following: 1 = complete denial of offence; 2 = partial denial (sex was consenting); 3 = minimizing (admits to sex offence but blames victim and/or minimizes harm); 4 = complete admission. As such, increasing scores on this variable are associated with greater openness about offence.

ability to examine rapists and child molesters separately was particularly important, as the current results highlighted some differences between the two groups regarding the associations between phallometric responding and age/MSI scores.

4.5.4 Limitations and avenues for future research

One of the primary limitations of the current study was that the sample contained a small number of older offenders (i.e., only 44 participants were aged 50 or older). While the overall sample was quite large, the vast majority of the offenders were within an age range where age-related physiological differences in penile responding were presumably minimal to nonexistent. As a result, it is possible that age may have demonstrated stronger correlations with phallometric responding had the sample included a larger number of older offenders. In a similar vein, the fact that age was significantly negatively correlated with PFE difference scores in the child molester sample but not in the rapist sample may have been partially attributed to the greater variance in age among the child molesters relative to the rapists ($M = 39.0$, $SD = 11.1$ versus $M = 37.7$, $SD = 8.7$, respectively); this provides support for the possibility that the restricted age range in the sample precluded finding additional significant results. As such, replicating the current study in additional sex offender samples, particularly samples containing greater numbers of older offenders, is necessary. Still, the overall findings of the current study provide additional evidence for the influence of age on phallometric responding. As noted, the use of PPG data transformations appears necessary in order to accommodate for the effects of age on physiological arousal.

The current study was also limited in that it relied on the original version of the MSI rather than the updated MSI-II (Nichols & Molinder, 2000). While the dataset included MSI-II profiles for a subset of the offenders, there was an insufficient number to allow for meaningful statistical analysis. Based on the promising findings using the original measure, subsequent research further establishing the utility of the MSI-II is certainly warranted. Indeed, research that has employed the MSI-II has been promising (Stinson & Becker, 2008; Tong, 2007), with Tong (2007) having asserted that the MSI-II may represent a viable alternative to PPG in the assessment of sexual deviance. Unfortunately, it would appear that there has been little subsequent research examining the utility of the MSI-II. Of particular importance would be research examining the prospective validity of the MSI as it pertains to predicting sexual recidivism.

Additional strengths, limitations, and avenues for future research applicable to the overall project are presented in the next chapter. Overall, the results of the current study provided some important insights into how best to report PPG data after taking into account the effects of age on phallometric responding, while also highlighting the usefulness of the MSI as measure of sexual deviance.

Chapter 5. Overall Discussion

5.1 Summary of Findings

The three studies that comprised the current research project demonstrated several important findings related to the assessment of sexual deviance in special sex offender populations. Study 1 demonstrated that visible minority offenders differed from White offenders in several important respects, including being younger at the time of committing their index offence, having fewer criminal convictions, being more likely to offend against adults, and being less likely to complete sex offender treatment programming. Regarding phallometric responding, both White and visible minority offenders demonstrated greater deviant responding to auditory stimuli relative to visual stimuli, with no other significant differences in responding based on stimulus type between the two groups of offenders. Overall, the results suggested that both White and visible minority offenders were likely able to imagine their ideal victim when being exposed to auditory stimuli, which may have been influenced by a variety of victim characteristics including, but not limited to, victim ethnicity.

Study 2 demonstrated a correlation between deviant phallometric responding and offenders' sexual offence history, highlighting the postdictive validity of PPG. While the majority of the hypotheses set forth for the study were not supported, PDS IM scores were found to be negatively correlated with mean deviant PFE responding, pointing to the influence of social desirability on phallometric responding. Most importantly, the results illustrated the effectiveness of using differential or ratio scores, as such transformations of PPG data appeared to accommodate for the influence of social desirability on deviant phallometric responding.

Finally, Study 3 demonstrated that, in general, offenders' age was negatively correlated with the magnitude of penile responding to phallometric stimuli. Although not consistent across all analyses, age was also generally found to remain a significant predictor of magnitude of phallometric responding even after controlling for offenders' degree of sexual deviance as measured by the MSI. As with Study 2, the results demonstrated the importance of using PPG data transformations in order to control for the effects of variables such as age. Taking into account the findings among both rapists and child molesters, it appears that ratio scores represent the more preferred method of data transformation. Finally, this study illustrated the utility of the MSI as a measure of sexual deviance.

The implications of the current findings as they pertain to theories of sexual deviance, the assessment of sexual deviance among sexual offenders, and the future use of penile plethysmography in particular, are discussed in the following sections.

5.2 Unique Contributions of the Current Project Using Archival RTC Data

While the current project relied on the use of archival data obtained from the RTC, several factors highlight the unique contributions of the present investigations outside of the existing published literature that has also utilized this data. First, while there was some overlap between the participants used in the existing literature and the current project, the samples utilized across the three studies here represented unique compositions of offenders that have not previously formed the exact samples of previous studies. Second, the majority of studies conducted by Dr. Looman and his colleagues have examined topics that were not germane to the current project and which frequently did not include phallometric responding. Specifically, previous studies have primarily focused on issues related to offender treatment and sexual recidivism (Abracen & Looman, 2006; Abracen, Looman, Ferguson, Harkins, & Mailloux, 2011; DiFazio, Abracen, & Looman, 2001; Looman & Abracen, 2011; Looman, Abracen, Nicholaichuk, 2000; Looman, Abracen, Serin, & Marquis, 2005; Looman, Morphet, & Abracen, 2012), comparisons of the predictive validity of various risk assessment instruments (Looman, 2006; Looman & Abracen, 2009; Looman & Abracen, 2011), and the differences between sex offenders and violent offenders on a variety of characteristics, including rates of alcohol and drug abuse (Abracen, Looman, & Anderson, 2000; Abracen, Looman, DiFazio, Kelly, & Stirpe, 2006; Looman, Abracen, DiFazio, and Maillet, 2004), intimacy deficits and the use of emotionally-based coping strategies (Looman, Abracen, DiFazio, and Maillet, 2004), and attachment patterns (Abracen, Looman, DiFazio, Kelly, & Stirpe, 2006). Additionally, Looman, Gauthier, and Boer (2001) aimed to replicate the Massachusetts Treatment Centre Child Molester Typology in an RTC sample of child molesters, while Wilson, Looman, Abracen, and Pake (2012) compared an RTC offender sample to that of an American treatment centre regarding a number of characteristics (i.e., demographic variables, risk level, and personality/psychopathic traits). In contrast to the above articles, the overarching purpose of the current project was to examine the efficacy of measuring sexual deviance, and in particular the utility of penile plethysmography.

For those previous studies conducted by Dr. Looman and his colleagues which did examine phallometric responding, several differences from the current investigations are noted.⁸ First, consistent with the initial point above, the current project utilized participant samples that, while sharing some overlap with previous studies, represented unique subsamples. Additionally, Dr. Looman has typically used somewhat different phallometric outcome variables compared to those that were utilized for the current project, using either PFE ratio scores exclusively (Looman, 2000), untransformed PFE variables (Looman et al., 1998), or z-score transformations (Looman, Dickie, & Maillet, 2008; Looman & Marshall, 2001; Looman & Marshall, 2005; Looman et al., 2012). Thus, the current project is the first to simultaneously examine PFE ratio, difference, and mean responding scores using RTC data. Furthermore, while there was some overlap in the research objectives of the current project and some of Dr. Looman's previous research, the current studies addressed unique research questions that have not yet been examined using RTC data. Specifically, while Looman and Marshall (2001) conducted a comparison of visual and auditory phallometric stimuli, Study 1 of the current project put forth unique hypotheses regarding the potential influence of ethnicity that were not examined by the previous authors. Similarly, Study 3 of the current project was the first to utilize RTC data in order to examine the potential utility of both PPG and the MSI in the assessment of deviance across the lifespan.

Perhaps the study which had the most overlap with the current project was that of Looman and colleagues (1998), in which the authors examined factors such as social desirability that were potentially related to phallometric non-responding; indeed, the third hypothesis of Study 2 (i.e., that deviant PPG responding would be negatively correlated with IM subscale scores) was a direct extension of the findings of Looman and colleagues (1998). However here again there were several notable differences between the two investigations, including: 1) unique participant samples, 2) the examination of PFE ratio and difference scores in the current study (whereas Looman and colleagues only utilized untransformed PFE variables), and 3) the use of a somewhat different analytical strategy in the current study (i.e., regression analyses versus one-way ANOVAs). Finally, and most importantly, Study 2 of the current project included an additional focus on intellectual functioning and the possible relationship between IQ, social

⁸ Such studies include Looman (2000); Looman et al. (1998); Looman, Dickie, & Maillet (2008); Looman & Marshall (2001); Looman & Marshall (2005); Looman, Morphet, & Abracen (2012).

desirability, and phallometric responding, and this was not examined by Looman and colleagues (1998).

Overall, while the current project relied on archival data, the novel study designs, hypotheses, and findings set it apart from previous research which has also utilized subsets of the data. Indeed, the current researcher was able to take advantage of this large and robust dataset in order to examine a variety of unique empirical questions.

5.3 Theoretical Implications of Findings

The explicit focus of the current project was largely practical in nature, with the desire to illuminate potential issues in the assessment of deviant sexual arousal among sex offenders and to inform more accurate measurement in this domain. Still, the various study findings provide some limited theoretical insights regarding the various influences of ethnicity, social desirability, IQ, and age on deviant sexual arousal and behaviours.

5.3.1 Ethnicity

Regarding the influence of ethnicity and culture on sexual offending, and before turning to the findings of the current project, it is particularly interesting to note that several researchers have highlighted risk factors for sexual offending that are consistent with descriptions of Aboriginal offender populations (who have been shown to be at an increased risk of sexually abusive behaviour (Motiuk & Nafekh, 2000; Trevethan et al., 2002; Welsh, 2000) and who demonstrate higher rates of sexual recidivism (Rastin & Johnson, 2002; Rojas & Gretton, 2007; Williams, Vallée, & Staubi, 1997)). Specifically, risk factors identified by various theorists include the experience of negative events in childhood such as poor attachment with caregivers (Beech & Mitchell, 2005; Marshall, 1993; Marshall & Barbaree, 1990; Marshall & Mazzucco, 1995), poor socialization (Marshall & Barbaree, 1990; Stinson et al., 2008), childhood abuse (particularly sexual abuse; Malamuth, 1998; Stinson et al., 2008; Ward & Siegert, 2002), parental psychopathology (Stinson et al., 2008), lack of appropriate modeling (Ward & Siegert, 2002), peer victimization (Stinson et al., 2008), cultural beliefs that relate to male dominance and hostility toward women (Finkelhor, 1984; Marshall & Barbaree, 1990), and transitory situational factors such as alcohol and drug use (Finkelhor, 1984; Marshall & Barbaree, 1990) or intense affective states (Hall & Hirschman, 1991; Knight & Prentky, 1990; Ward & Siegert, 2002). Examining Aboriginal offender populations, they have been found to be more likely to experience childhood family dysfunction such as parental separation and domestic abuse

(Ellerby & MacPherson, 2002; Leclair, 1996; Johnston, 1997; Trevethan et. al, 2002), parental neglect, abandonment, substance abuse, and criminal activity (Ellerby & MacPherson, 2002; Leclair, 1996), and childhood sexual abuse (Ellerby & MacPherson, 2002). Furthermore, Aboriginal offenders are more likely to espouse traditional gender roles (Borzecki et al., 1988; Olver, et al., 2016), and to have higher rates of substance abuse (Ellerby & MacPherson, 2002; Olver & Wong, 2006; Rastin & Johnson, 2002). The fact that such findings among Aboriginal offenders so closely parallel the risk factors previously identified by researchers underscores the theoretical and practical utility of such theories of deviance.

Although it was not possible to examine Aboriginal populations specifically in Study 1 of the current project, the overall results of the investigation have some theoretical implications regarding the influence of ethnicity on sex offending in general. Most importantly, it was found that both visible minority and White offenders demonstrated greater deviant penile responding to auditory stimuli relative to visual stimuli, with this author suggesting that auditory stimuli may have allowed participants to imagine their ideal victim. The characteristics that comprise an individual's ideal sexual partner likely encompass a number of factors, such as hair colour and physical build. Additionally, as noted in section 2.1.5, humans tend to find members of their own ethnic group to be more attractive than members of other groups (Liu et al., 1995; Swami et al., 2009), and sexual assault victims have been found to be of the same ethnicity as the offender in a substantial majority of reported cases (i.e., 79% to 88%; Ellerby & MacPherson, 2002; Greenfeld, 1997; Nahanee, 1996). Taken together, these findings suggest that ethnicity also plays a large role in an individual's determination of sexual attractiveness. Therefore, it is possible that the risk of a sexual assault occurring increases the more closely that the phenotypic expressions of ethnicity (e.g., skin colour, facial features) of potential victims resemble an offender's ideal of sexual attractiveness. In this sense, the ethnicity of an available potential victim may be viewed as a transitory situational factor that influences the risk of a sexual assault occurring. Current theories of sexual deviance do not appear to account for the potential influence of ethnicity, and as such this represents an interesting avenue for further research.

5.3.2 IQ and social desirability

Given that no significant relationships between IQ and either phallometric responding or PDS IM scores were found in Study 2, there is little from the current project that could be used to inform theories of sexual deviance in this regard. Still, it is notable that low IQ offenders from

the current sample were more likely to be diagnosed with pedophilia in comparison to average IQ offenders; this finding is consistent with previous researchers (Day, 1993; Hawk et al., 1993), including those who have posited intellectual disability as an etiological risk factor for the development of deviant sexual interests (Day, 1994; O'Callaghan, 1998). Given such findings, it is perhaps interesting that integrative theories of deviance have typically not addressed the potential influence of intellectual disability on the development or maintenance of deviant sexual interests. Alternatively, some researchers have suggested that elevated paraphilia diagnosis rates among intellectually disabled populations may reflect a phenomenon of 'counterfeit deviance' (i.e., "persons with intellectual disability whose behaviours appeared like paraphilia but served a function that was not related to paraphilia sexual urges or fantasies" (Griffiths, Hingsburger, Hoath, & Ioannou, 2013, p. 471).

Regarding intellectual functioning, while no effects of IQ were found in Study 2, it was demonstrated that social desirability (as measured by the PDS IM subscale) was correlated with mean deviant PFE responding, suggesting that offenders who engage in impression management may also be more likely to attempt to suppress penile responding to deviant phallometric stimuli. Embedding this finding within a theoretical context, several researchers have highlighted various personality characteristics that can increase the risk of deviant sexual behaviour, including egocentricity, selfishness, and lack of empathy (Geer et al., 2000; Hall & Hirshman, 1991; Hanson & Scott, 1995; Malamuth, 1998; Marshall, 1993; Stinson et al., 1998; Ward and Siegert, 2002), impulsivity (Groth, 1979; Stinson et al., 1998; Ward and Siegert, 2002) and defensiveness (Malamuth, 1998). In this vein, some researchers have proposed that social desirability reflects a trait-like response pattern that can be most accurately construed as an engrained aspect of personality. Specifically, Li and Bagger (2006) found that impression management was strongly correlated with the personality dimensions of conscientiousness, agreeableness, and emotional stability (as conceptualized in the five-factor model of personality). Individuals characterized by high levels of the aforementioned personality traits would generally demonstrate attributes of careful, responsible, and goal-directed behaviour, sensitivity, cooperativeness, and courteousness, as well as being self-confident and self-assured. As such, the examination of personality constructs related to socially desirable responding may provide additional theoretical insight into the etiology and maintenance of deviant sexual behaviours.

Interestingly, researchers have consistently demonstrated that higher levels of impression management among offenders are associated with a decreased risk of recidivism (Hanson & Wallace-Capretta, 2004; Mills & Kroner, 2005, 2006; Mills, Loza, & Kroner, 2003; Peersen, Sigurdsson, Gudjonsson, & Gretarsson, 2004). In relation to the current study, while offenders who demonstrated a high degree of impression management may have more actively attempted to suppress deviant penile responding to phallometric stimuli, it is also possible that they were indeed at a lower risk to reoffend as a result of those personality factors that influenced their socially desirable responding in the first place (e.g., Tan & Grace, 2008). Indeed, the personality traits reviewed above that are associated with impression management are largely congruent with proposed protective factors among sex offenders (i.e., those “factors that enable or assist desistance from (sexual) offending among those that have already offended”; de Vries Robbe, Mann, Maruna, & Thornton, 2014, p. 2), such as effective problem-solving and consequential thinking skills, a willingness to engage in rule-abiding behaviour, effective interpersonal functioning, and a concern for the wellbeing of others (de Vries Robbe et al., 2015). Similarly, offenders characterized by a high degree of impression management may experience anxiety related to social disapproval, which may discourage them from engaging in subsequent criminal behaviour (Peersen et al., 2004; Sigurdsson, Gudjonsson, & Peersen, 2001). While it was not possible to examine recidivism rates among the current sample, it is interesting to consider social desirability as a personality construct that serves as a protective factor against the commission of subsequent sex offences. While theories of sexual deviance have examined a variety of personality-related variables that influence the etiology and maintenance of sex offending behaviour, the specific impact of impression management tendencies may be informative in further understanding the differences between offenders who go on to commit subsequent offences and those who do not (or perhaps more interestingly, between individuals who possess deviant sexual interests and commit offences versus those who possess such interests but never commit an offence).

5.3.3 Age

Briefly looking at the influence of age within a theoretical context, several researchers have posited largely genetic and/or biological causes of deviant sexual interests (e.g., Aigner et al., 2000; Cantor et al., 2008; Coccaro & Kavoussi, 1996; Corley et al., 1994; Cummings, 1999; Day, 1994; Galski et al., 1990; Hucker & Bain, 1990; Kafka, 1997; Lang, 1993; Lang et al.,

1990; Marieb, 2001; O’Callaghan, 1998; Raine & Buchsbaum, 1996; Seto, 2012; Stoff & Vitiello, 1996; Thornhill & Palmer, 2000), and this is reflected in the various integrative theories of deviance (Finkelhor, 1984; Groth, 1979; Groth et al., 1982; Hall & Hirschman, 1991; Knight & Prentky, 1990; Malamuth, 1998; Marshall & Barbaree, 1990). Given that the etiology of deviant sexual interests, particularly sexual interest in children (e.g., Seto, 2012), is likely to have a strong genetic component among many sex offenders, it follows that such interests would persist across the lifespan regardless of actual sexual activity, analogous to non-deviant interests and behaviours among the general population. Turning to the results of Study 3, it was generally found that deviant penile responding was negatively correlated with age. Additionally, while self-reported deviance (as measured by the MSI R and CM scales) was correlated with PPG-assessed deviant arousal, MSI scores were not correlated with offenders’ age. Taken together, these findings reinforce theoretical accounts of deviance, in that while physiological responding decreases with age, underlying sexual interests are likely deeply engrained and therefore persist across the lifespan.

5.4 Overall Strengths of the Project

The particular strengths of the individual studies were discussed in previous chapters. Overall, the current research project addressed several gaps in the empirical literature pertaining to visible minority, low IQ, and aging sex offenders. The project also benefited enormously from the comprehensive assessment protocol implemented by Dr. Looman and his fellow researchers at the RTC, as this allowed for the examination of a wide array of pertinent socio-demographic, mental health, and offence-related variables. Finally, the use of several different PPG outcome variables in the current studies was a particular strength, as this is not common practice, at least in the majority of published research articles on the assessment of deviant arousal (see Earls et al. (1987), Harris et al. (1992), Lykins et al. (2010), and Merdian & Jones (2011) for examples and/or discussions of the use of various PPG reporting methods). The findings of the current studies illustrated the fact that important differences in the interpretation of phallometric profiles can result from one’s choice of outcome variable, and such differences appear to be the norm rather than the exception. Thus, the current findings demonstrated the importance of carefully considering how best to interpret and report phallometric data in the context of the assessment and the implications of the results. For example, researchers may have an empirical interest in examining and reporting a variety of phallometric outcome variables, including participants’ raw

penile responding, PFE responding, and/or deviance indices based on z scores or PFE responding. In contrast, clinicians (and their clients) may be better-served by the exclusive reporting of differential or ratio indices, as such transformations appear to accommodate the effects of extraneous variables that can impact phallometric responding, and that in turn could unduly influence the perception of an offender's risk to sexually reoffend.

5.5 Overall Limitations, Implications, and Avenues for Future Research

A number of limitations pertaining to the various studies were discussed in previous chapters. Aside from those limitations already noted, various other limitations applied to the research project in general. First, the project utilized archival data obtained from the RTC in Kingston, Ontario. As with any archival research, one must rely on the efforts of previous researchers and put trust in the integrity of the data collection procedures. The use of archival data also limited the ability of the current researcher to examine research questions that may have been possible given direct contact with the participants. As noted in Chapter 3, for example, it would be interesting to determine if individuals characterized by some degree of cognitive impairment are less effective at using mental distraction strategies during phallometric assessment when explicitly instructed to do so; to examine such a research question would of course require direct contact with the participants. Finally, and perhaps more existentially, the use of archival data removes the researcher from the lived experience of working directly with the participants. This lack of contact may be particularly salient when examining highly stigmatized populations (of which sex offenders are certainly included), as such individuals are already too often dehumanized (see Waldram (2012) for a poignant ethnographic analysis of conducting work with sex offenders). The current researcher is fortunate enough to work directly with individuals convicted of sexual offences in his professional capacity at the Regional Psychiatric Centre in Saskatoon; it is hoped that such ongoing interactions have allowed for a simultaneously objective, insightful, and sensitive approach to the current subject matter.

Additionally, while the use of several PPG outcome variables (i.e., mean responding, difference scores, and ratio scores) represented a strength of the current study, all of these variables were based on PFE responding. As noted in section 1.8.3, z-score transformations are also a popular method for reporting phallometric data, and such transformations possess several advantages as well. While it was beyond the scope of the current project, additional research comparing PFE- and z-score-derived data would be informative, as previous studies have noted

differences in discriminative power as a function of the outcome variable being utilized (e.g., Earls et al., 1987; Harris et al., 1992). Furthermore, Study 1 revealed differences in penile responding that can result from the use of visual or auditory phallometric stimuli, and additional research is necessary in order to further elucidate such potential differences. This is particularly noteworthy given that the current project relied on specific visual and auditory stimulus sets; further research comparing a variety of stimulus sets is necessary, as penile responding may vary as a function of the particular stimulus set being employed. For example, in a meta-analysis of 17 studies utilizing three separate auditory phallometric stimulus sets among rapists, Lalumiere and Quinsey (1994) found stimulus set to be a moderating variable of penile responding, although Looman (2000) suggested that the results of the study were likely due to the use of primarily psychiatric samples which are not representative of typical offenders.

In a similar vein to Looman's (2000) point above, the current project relied on data from a high risk/high needs Canadian sex offender sample which may not be representative of typical sex offender populations. As such, the study findings may not necessarily generalize to other sex offender populations; replication is required among other sex offender samples representing a broad spectrum of criminogenic risk/need levels, as well as including offenders from a variety of national and international jurisdictions. This is also important given that some of the findings of the current study, while reaching statistical significance, represented small effect sizes. Thus, additional research will help to elucidate the practical significance of such findings in the assessment of sexual deviance.

Perhaps one of the most important avenues for future research will be the ongoing development and validation of alternative measures of sexual deviance outside of the phallometric procedure. While penile plethysmography remains the most well-established and widely-used measure of deviant sexual arousal, several significant issues have been raised regarding the continued use of the procedure, including the cumbersome and intrusive nature of the assessment process, the lack of standardization in apparatus, stimuli, and methods of reporting data, issues of low responding, habituation, and faking, as well as various ethical and legal implications concerning the nature of the stimuli and assessment procedure. While some of these concerns could, albeit with some difficulty, be addressed (e.g., standardizing assessment procedures across phallometric labs), other issues are not amenable to change, such as the inherent intrusiveness of the testing process.

As a result of researchers and clinicians attempting to address the various shortcomings of PPG in the assessment of sexual deviance, the development and validation of alternative assessment procedures has come to represent a burgeoning field of research. While other physiological measures of arousal have also been developed (e.g., galvanic skin response measurement, pupillometry, viewing time paradigms), concerns regarding the validity of such procedures have been noted (as discussed in section 1.9.1). Recent developments in cognitively-based measures of sexual interests, however, have shown particular promise. Indeed, while Marshall (2014) recently encouraged ongoing research in order to further refine phallometric assessment procedures, he acknowledged that PPG may ultimately be replaced by the various cognitively-based techniques that have recently emerged, including modified Stroop tasks and implicit association tests. Finally, other research (including the current project) has identified self-report instruments, such as the MSI, as potentially viable alternatives to PPG as well. Still, the efficacy of various cognitive and self-report measures has yet to be firmly established, nor is it clear if their use will be widely accepted by clinicians working within correctional environments. In contrast, while the research regarding the efficacy of penile plethysmography is not unequivocal, the procedure is supported by a wealth of empirical data that has generally established it as a valid measure of deviant sexual arousal, and it enjoys widespread use in this regard across a range of national and international forensic settings.

Taking into account both the strengths and limitations of penile plethysmography, it is possible that the near-exclusive reliance on the procedure in the assessment of sexual deviance will begin to wane over the coming years, and instead the future role of phallometry may become that of a gatekeeper of sorts: a well-validated measure against which newer techniques can be compared in order to identify their potential utility. While the results of a phallometric assessment rely on several levels of inference (O'Donohue & Letourneau, 1992) and should never be construed as a direct representation of an individual's sexual preferences, it would be difficult to argue that the procedure could not serve as an initial litmus test in an effort to establish the validity of alternative measures of sexual deviance. Indeed, PPG continues to be referred to as the "gold standard" for the measurement of sexual arousal (Muller et al., 2014; Murphy, Ranger, Stewart, Dwyer, & Fedoroff, 2015), and the results of the current project also contributed to the evidence base supporting the utility of the procedure among federally incarcerated sex offenders.

Furthermore, the current value of penile plethysmography in the context of assessing sexual recidivism risk cannot be understated. As noted in Chapter 1, sexual deviance, as measured by PPG, has consistently been demonstrated to be one of the strongest predictors of sexual recidivism (e.g., Hanson & Bussiere, 1998; Hanson & Morton-Bourgon, 2005; Rice et al., 1990). Thus, phallometric assessment often represents a crucial element in the accurate determination of recidivism risk. Indeed, many of the most well-validated and widely-used sexual risk assessment measures (e.g., STABLE-2007; Hanson, Harris, Scott, & Helmus, 2007; VRS-SO; Wong et al., 2003) include items related to sexual deviance, and the current empirical literature has established PPG as the best measure of such deviance. Of note, the current project found that phallometric assessment was an appropriate measure of deviant arousal among visible minority offenders; this is particularly useful information for clinicians, as it indicates that PPG allows for a fair and objective measure of deviance among these offender groups (while the appropriateness of using certain risk measures with minority offenders currently represents a topical area of debate in Canada; e.g., *Ewert v. Canada*, 2015). Thus, given the established and widespread use of penile plethysmography in both research and clinical domains, it is unlikely that the procedure will disappear from the forensic arena any time soon. Ultimately, the continued study of PPG, as well as other measures of sexual deviance, will only serve to benefit our understanding and ongoing work within sex offender populations.

As a matter of conclusion, it is perhaps fitting to return to the work of Richard von Krafft-Ebing, whose writings so greatly influenced our modern conceptualizations of sexual deviance. In his preface to the first edition of *Psychopathia Sexualis*, Krafft-Ebing (1886/1997) remarked that “[e]ven at the present time, in the domain of sexual criminality, the most erroneous opinions are expressed and the most unjust sentences pronounced, influencing laws and public opinion” (pp. iv). It is somewhat disheartening that such a statement could just as easily be written today, as it is arguably as relevant to our current social landscape as it was over 100 years ago. And thus there is an ethical imperative to continue to research sexual deviance in general, and sex offender populations in particular; such knowledge must be utilized in order to inform social, legal, and political discourse regarding the most efficacious manner in which to manage and treat individuals who have committed sexual offences. It is this researcher’s hope that the current project has contributed to such an endeavour, if even to the smallest degree.

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Appendix A

University of Saskatchewan Behavioural Research Ethics Board Certificate of Approval



UNIVERSITY OF
SASKATCHEWAN

Behavioural Research Ethics Board (Beh-
Certificate of Approval

PRINCIPAL INVESTIGATOR
Steve Worchel

DEPARTMENT
Psychology

DATE
13-215

INSTITUTION(S) WHERE RESEARCH WILL BE CONDUCTED
Regional Psychiatric Centre (Prairie) 1
PO Box 92-5
2829 Central Ave. S7N 3X5

STUDENT RESEARCHER(S)
Lyndi Kurlerbaez

FUNDER(S)
INTERNALLY FUNDED

TITLE

Current Issues Related to the Assessment of Sexual Deviance in Special Sex Offender Populations

ORIGINAL REVIEW DATE
23-Sep-2013

APPROVAL ON
23-Sep-2013

APPROVAL OF
Application for Behavioural Research
ethics Review
Secondary analysis of de-identified data

EXPIRY DATE
22-Sep-2014

Full Board Meeting ☐

Delegated Review ☒

CERTIFICATION

The University of Saskatchewan Behavioural Research Ethics Board has reviewed the above-named research project. The proposed was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions set out in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol or consent process or participants.

Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for Research Ethics Board consideration in a timely and appropriate manner.

ONGOING REVIEW REQUIREMENTS

In order to receive annual renewal, a status report must be submitted to the RER Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion. Please refer to the following website for further instructions: http://www.usask.ca/ethics/research/ongoing_review.html


Beck Bishop, Chair
University of Saskatchewan
Behavioural Research Ethics Board

Please forward all correspondence to:

Research Ethics Office
University of Saskatchewan
Box 5500 RMC University, 100 W 16 Ave. Saskatoon, Sask
S7N 5A6, S7N 5A6
Telephone: (306) 966-5975 Fax: (306) 966-4063

Appendix B

Correctional Service of Canada Research Application and Undertaking Approval Form

	Correctional Service of Canada Service correctionnel du Canada	PROTECTED / PROTÉGÉ A ONCE OF UNIT FOR NOTE: Reference document = C PUT AWAY ON FILE - CLASSER AVEC ADMINISTRATIVE OR OPERATIONAL DOSSIER ADMINISTRATIF OU OPÉRATIONNEL Original - Research Branch / Direction de la recherche
RESEARCH APPLICATION AND UNDERTAKING	DEMANDE DE RENSEIGNEMENTS À DES FINS DE RECHERCHE ET ENGAGEMENTS CORRÉLATIFS	
NOTE - See reverse for Terms and Conditions		NOTE - Voir les Modalités et conditions au verso
Date submitted / Date déposée: 2013/12/08 (YYYYMMDD)		
Research Project - Projet de recherche Project Title / Titre du projet: Current Issues Related to the Assessment of Sexual Deviance in Special Sex Offender Populations		
Project Description / Description du projet <p>Although several measures of male sexual arousal have been developed in recent years, the predominant measure of deviant sexual arousal within offender populations has historically been phallometric assessment. The assessment of sexually deviant interests among offenders entails the use of neutral and deviant sexual stimuli which may be presented in visual, audio, or video format. Using a phallometric strain gauge, deviant sexual arousal is indicated by a significant increase in penis size in response to deviant stimuli (e.g. stimuli involving pre- or post-pubescent children, or depicting coercive acts) relative to a participant's responding to neutral stimuli (i.e. age-appropriate, non-coercive sexual depictions).</p> <p>Given the widespread popularity and long-standing use of phallometric testing to measure sexual arousal within forensic settings, research regarding its efficacy with particular sex offender populations remains surprisingly scarce. As such, the current project will be an archival investigation consisting of three studies that will examine the validity of phallometric assessment with the following sex offender populations: 1) Aboriginal offenders, 2) cognitively impaired offenders, and 3) older offenders.</p> <p>Study one will examine the efficacy of using visual and auditory stimuli during phallometric testing with Aboriginal offenders. Briefly, visual phallometric stimuli consist of sets of sexually explicit pictures that are presented to the offender, while auditory stimuli are comprised of vignettes describing various sexual situations. It is hypothesized that auditory stimuli will elicit significantly more deviant responding from Aboriginal offenders in comparison to their responses to visual stimuli, as research in the anthropological field has found that humans generally find members of their own ethnic background to be more attractive than members of other ethnic backgrounds. As such, because visual stimuli sets consist almost entirely of pictures of Caucasian individuals, Aboriginal offenders may show greater responding to auditory stimuli, as it allows them to imagine their ideal victim (i.e. someone of the same ethnicity).</p> <p>The purpose of study two will be to examine the appropriateness of phallometric testing with cognitively impaired offenders. Research has indicated that cognitively impaired offenders tend to display greater openness about their deviant thoughts and behaviours. As such, it is possible that these offenders may not be able to fully appreciate the potential consequences of their deviant responding, and may therefore not consider attempting to suppress their arousal during phallometric assessment. In contrast, extensive research has shown that many (non-impaired) offenders are able to suppress their arousal to phallometric stimuli, and upon questioning often report not attending to the stimuli or using mental imagery methods in order to suppress arousal. Thus, it is hypothesized that cognitively impaired offenders will demonstrate significantly higher levels of deviant responding in comparison to non-impaired offenders.</p> <p>The purpose of study three will be to examine the efficacy of phallometric assessment in older offenders (i.e. those aged 50 and above). Given that men aged 50 and above generally display lower levels of physiological responding to sexual stimuli (e.g. reduced size and duration of erections), it is possible that phallometric procedures may provide an inaccurate assessment of deviant sexual interests in this population. The current study will compare participants' phallometric response profiles with their test results from a validated self-report measure of sexual deviancy (the Multiphasic Sex Inventory [MSI] in a group of 'young offenders' (those aged 49 and below) and 'old offenders' (those aged 50 and above). It is hypothesized that there will be significantly greater correspondence between phallometric and MSI-II profiles in the young offender sample relative to the old offender sample, as the former group will presumably provide more accurate phallometric profiles.</p>		

Class of Information Requested – Type/catégorie des renseignements demandés

Current project will exclusively use archival data that has already been collected at the Regional Treatment Centre (RTC) in Kingston, ON, as part of their routine assessment procedure for sexual offenders. Ethical approval has been obtained from the Behavioural Research Ethics Board at the University of Saskatchewan, and once approval has been obtained from the Correctional Service of Canada, the data will be released by Dr. Jan Looman of the the RTC to the primary investigator and used in his lab at the University of Saskatchewan for subsequent analysis pertaining to the current project.

Primary Researcher – Chercheur principal

Name and title – Nom et titre

Stephen Wormith, Ph.D., Professor,
University of Saskatchewan

Address – Adresse

Empus Drive, 154 Arts, Saskatoon, SK S7N 5A5

Operational unit – Unité opérationnelle

Sector – Secteur

Region – Région

Telephone number – N° de téléphone
(306) 986-6818

Other Researchers – Autres chercheurs

Name and affiliation – Nom et affiliation

Jan Kurlenbach, B.A. (Hons.), Graduate Student in Clinical Psychology, University of Saskatchewan

Name and affiliation – Nom et affiliation

Telephone number – N° de téléphone
(306) 221-9090

Telephone number – N° de téléphone

Telephone number – N° de téléphone

Approval – Approbation

Signature of Primary Researcher Director (print) – Nom du Directeur du chercheur principal (autres initiales)

Primary Researcher Director – Signature – Directeur du chercheur principal

Date (YYYYAAAMMJJ)

Signature of Director, Access to Information and Privacy (print) – Nom du Directeur de l'Accès à l'information et de la protection des renseignements personnels (autres initiales)

Director, Access to Information and Privacy – Signature – Directeur de l'Accès à l'information et de la protection des renseignements personnels

Date (YYYYAAAMMJJ)

Signature of Director General Research (print) – Nom du Directeur général de la recherche (autres initiales)

Andrea Moser

Director General Research – Signature – Directeur général de la recherche

Date (YYYYAAAMMJJ)

APR 09 2014

Appendix C

RTC Sex Offender Treatment Program Consent Form

SEX OFFENDER TREATMENT PROGRAM REGIONAL TREATMENT CENTRE (ONTARIO)

TREATMENT CONTRACT

I, _____ FPS# _____
of _____ Institution consent to participate in a 7 month sexual offender
treatment program at the Regional Treatment Centre (Ontario).

The treatment program has been explained to me. I understand that I will be admitted to the RTC(O) to take part in a treatment program consisting of both group and individual therapy. Treatment will address my assessed needs and may cover areas such as

- 1) Autobiography
- 2) Victim Awareness
- 3) Relapse prevention
- 4) Human Sexuality
- 5) Social Skills
- 6) Arousal Reconditioning
- 7) Psychopharmacology

As well, I understand that the completion of pre and post-treatment phallometric testing is considered an important part of the treatment process and will be required.

I understand that as part of the program requirements I will be asked to present my autobiography in group. This presentation will include information regarding my offense history. In cases where information regarding the autobiography contradicts or is significantly different than information contained on file the clinical team reserves the right to question such discrepancies.

I agree to cooperate fully in treatment, and understand that failure to participate in either individual or group sessions may lead to my discharge. I also agree to follow unit rules, which include abstaining from the use of drugs and alcohol, no verbally or physically threatening behaviour directed toward other inmate/patients or staff, and respecting the confidentiality of those involved in treatment. Violation of these rules may be seen as grounds for dismissal from the program. I will be given a copy of the unit rules upon admission.

I understand that approximately mid-way through the program my progress will be reviewed in a formal case conference and I will be given feedback regarding my progress at this time. As well, I may expect feedback regarding my progress in treatment on a more informal basis throughout treatment.

While completion of treatment in no way guarantees an offense-free future, completion

of properly designed treatment programs has been shown to lead to reductions in both sexual and non-sexual re-offending in comparison to untreated groups.

I understand that one of the functions served by the RTC(O) is to provide training for students from various educational facilities in the area. As a result some of the people with whom I interact during the treatment program may be students here on placement.

LIMITED CONFIDENTIALITY

I understand that professional confidentiality will be maintained, but there are important limitations to that confidentiality. I understand that the information obtained in treatment will be summarized in a report and that anything I say may be quoted in that report. I also understand that the Treatment Team will consult with my Case Management Team during the treatment process. The Final Treatment Report will be placed on the Psychology, Treatment Centre, and Case Management files, as well as on the CSC nation-wide computer system (OMS). I also understand that a copy of the report is available to me. I understand that case management staff, the National Parole Board and anyone else with legal authority will have access to the report. For example, in the event of a release which the Warden considers to be a high risk release, and in the case of detained offenders being released on Warrant Expiry, information contained in the report may be included in information released to community treatment facilities and the police.

I understand that the Treatment Team, as professional, may be obliged by law to report to the appropriate authorities any disclosures made by myself that reveal in sufficient detail any previously unreported offense.

I also understand that if there is concern that I might harm myself or someone else the treatment team is obliged to intervene even if confidentiality must be broken.

I understand that under the Ontario Child and Family Services Act a professional, must report child abuse to a Children's Aid Society. Therefore if I give specific information about child abuse that is not already known to Children's Aid, that information might need to be given to Children's Aid.

RESEARCH

I understand that the results of my participation in treatment and assessment may be used for research purposes, including research related to treatment outcome (i.e., reduced recidivism). However, I have been assured that such results will not be made public in any way which may identify me personally.

PROGRAM COMPLETION

Upon completion of the treatment program I will be returned to my parent institution. It should be noted that participation in the treatment program in no way guarantees favorable decisions for detention reviews, PFVs, transfers or conditional release.

Note: The program is not considered to be completed until the final reports are finished. Thus, you may be required to stay at the RTC for a period of time after the completion of the groups.

I understand the above, and have had the opportunity to ask questions, and hereby agree to the treatment which is being offered me.

I understand that I am free to withdraw from the treatment or participation in research at any time that I choose.

SIGNED: _____
DATED: _____
WITNESSED: _____
NAME OF WITNESS: _____

Distribution: RTC file
Psychology File

Appendix D

RTC Phallometric Testing Consent Form

Regional Treatment Centre (Ontario) Sex Offender Program Assessment Lab Consent to Phallometric Testing

Testing Information:

Phallometric testing is completed in a private room and the phallometric test will be conducted by the Behavioural Technician via a computer.

Phallometric testing involves placing a mercury-in-rubber strain gauge on your penis. The mercury-in-rubber strain gauge will measure your sexual arousal during slide or audiotape presentations.

You will be informed by the Behavioural Technician of proper placement of the strain gauge on your penis. You will be told to pull your pants and underwear to your knees, place the strain gauge on your penis, and to place a towel over your mid section to ensure that you are not exposed during the testing procedures.

While you are getting prepared for a phallometric test, the closed circuit camera is not on.

Once you inform the Behavioural Technician that you are ready to start the test, the Behavioural Technician will enter the room and plug in the lead wires of the mercury-in-rubber strain gauge. The Behavioural Technician will ensure you are seated properly for the test and that you are wearing the headphones properly. Upon leaving the lab, the Behavioural Technician will turn on the closed circuit camera.

Prior to the phallometric test commencing, the lighting in the lab will be turned down and you will be given a set of instructions over the headphones.

During the phallometric test, you will be monitored on a close circuit camera to ensure you are paying attention to slide/audio material and that you have not fallen asleep.

You will be exposed to various types of tests that include:
Female/male children being sexually/physically assaulted, nude pictures of female/male children, heterosexual/homosexual adult consent scenes, sexual /physical assaults against adult females/males, and nude pictures of adult females/males.

Consent:

I will agree to complete a minimum of four phallometric tests. Two of these tests will involve adult content and two of these tests will involve child content.

Depending on my sexual history, I could be required to complete additional phallometric testing.

I will be expected to participate in the phallometric testing at the beginning of the program and at the end of the program.

My phallometric test results are confidential. They will be discussed with me by the Psychologist assigned to my case, within a reasonable time upon completion of my final phallometric test. My phallometric results may also be shared with members of my treatment team. Phallometric test data will be used for research purposes; however, no identifying information is included in presentation of research results.

I can stop the phallometric test at anytime, as this testing is voluntary. Termination may have a negative impact on my case, e.g. Parole Officer/National Parole Board Decisions, etc.

I agree to participate in the above mentioned procedures.

Name: _____ Date: _____

Witness: _____

Distribution: STS File

Appendix E

Study 2 Hierarchical Regression Analysis Summary for Four Offender Variables Predicting Phallometric Responding

Ratio score predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.21 (.17)**	
No. sex convictions	.20	.06	.46**		
No. previous SO treatment programs	-.02	.25	-.01		
Step 2:				.24 (.18)**	.03
PDS IM	-.03	.03	-.17		
Step 3:				.26 (.19)*	.02
IQ	-.02	.02	-.15		
Diff. score predictor variable	<i>B</i>	<i>SE B</i>	β	R^2 (adj. R^2)	ΔR^2
Step 1:				.22 (.18)**	
No. sex convictions	1.40	.85	.23		
No. previous SO treatment programs	8.87	3.73	.34*		
Step 2:				.22 (.17)*	.00
PDS IM	-.16	.36	-.06		
Step 3:				.24 (.17)*	.02
IQ	-.31	.30	-.14		

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.